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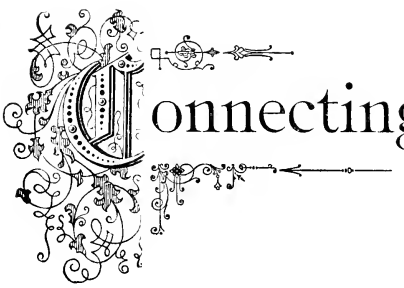

Connecting Link,

BY

EMMA MARWEDEL.


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THE

Connecting Link

TO CONTINUE THE THREE-FOLD DE-VELOPMENT OF THE CHILD, FROM THE KINDERGARTEN TO THE MANUAL-LABOR SCHOOL.

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BY

EMMA MARWEDEL.

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INTRODUCTION.

"Oh, how happy this work will make our children; how good and how useful they may become to themselves and to others through this fascinating initiation into manual dexterity!"

This was the exclamation of my California friend on first seeing these models for the Connecting Link. In her simple, yet deeply expressive words, spoke the mother heart of our great Nation. In them was embodied the truth that "Childhood's happiness is Manhood's blessing."

We owe our children not simply a schooling, but a happy, rounded development of their best capacities.

Compulsory education will no longer be necessary when the school can be made a joy to the child. It is not the toilsome, overburdened, dissatisfied school-child that makes the best citizen. It is the light-hearted, creative boy or girl who has learned in childhood to love work for its own sake that becomes the best man or woman in after life.

The following paper is not offered as a completed theory to this point, but as a mere collection of statements, in part theoretical, and in part practical.

The practical part illustrates, descriptively and by drawings, what has already been proved successful in filling the gap between the Kindergarten and the Manual Labor School. It may be aptly termed the "Connecting Link," and is meant to be applied as the stepping-stone to a systematized development, presenting a logical sequence to the principles, method, and occupations prescribed by Frœbel in the kindergarten.

Personal investigation and study of the existing labor schools in Europe for young children, together with the inspiration gained from the reform through extension of play-work, have developed the plan of this pamphlet, which presents a series of occupations suited to the growing capacities of the child. The extension of Frœbel's system into manual training is being ably promoted in America through Hailman's High School, Parker's Normal School, E. Marwedel's Circular Drawing System and Botany, and many other less known methods. The works of Miss Eva Rodhe,

of Gothenburg, Sweden, and Franz Hertel, of Zwickau, present the first stages of the "Connecting Link." They are descriptively illustrated. The use of the knife as a tool introduces the cutting of stiff paper, bristol-board, and pasteboard, as an advance from the use of the scissors and soft paper. The capacity of the child from five to eight years of age is thereby gradually developed to work in hard wood, thus forming the introduction to the Manual Training School.

The merit of both these systematized occupations lies in their admirable adaptation to the needs of a school reform for children in the primary department. The vast variety of illustrations herewith presented stimulates the creative powers of the child, and gives rise to endless delight in play-labor. The adjoined interesting article by Professor Hirschfelder, of Leipsic, will afford welcome suggestions to parents and teachers who feel the responsibility of seeking a scientific solution of the higher problems of education.

P. S.—A year has elapsed since writing the above. A year not less devoted to general discussion on our educational platform concerning the pro and contra as regards the introduction of manual dexterity in our public schools.

While France, Belgium, Germany, including Austria, even Denmark and Russia, recognize the Slöyd or Swedish system, the original move in this direction, these countries show a marked difference in their curriculum of school work. Greater variety of work is carried on. Industrial art is fostered, theoretically and practically, using individual designing and ornamental work preparatory to studies of art, while the making of apparatus (See Director Alois Bruhns' remarks on public schools at Vienna) illustrating problems of natural science presents a not less important branch in manual labor schools.*

The American is a born workman—to be trained into an artisan. To become this he needs plastic rest to unfold his talents in this direction. The child's critical or negative propensities are too much cultivated and fostered (all over the civilized world) at the expense of the development of its warm, affirmative, and harmonious conception of things. (Die harmonisch anschauliche Seite.)

* Director Bruhns, in personal conversation, complained exceedingly about the lack of preparation and skill he experienced in the boys entering his classes at the age of 10 or 11 years desirous of making physical instruments—a fact that urged the writer to propose paper cutting and wood cutting with a knife as most admirably adapted to serve as connecting link between the kindergarten and manual training.

In short, intellectual powers are more considered than emotional powers, while psychology points to emotional impulses as the motor forces to abstract thinking.

The kindergarten, or Frœbel's system, with its ethical aims, acts in strict accordance with these natural laws. It knows that without interest, sympathy, or love, the necessary self-activity (called attention or concentration) is not aroused and no sufficient reasoning power awakened to retain a lasting impression.

Pedagogical insight begins to recognize and analyze these effects as the germ period of the coming artisan.

The first years in school life, less burdening with school work, and the most accessible for the application of anything that is true and beautiful, have therefore been chosen, and it is proposed to continue the dealings with the beautiful preparatory to industrial art by keeping and cultivating the child's taste, creative faculties and skill.

My last work, "Form and Color," presents another attempt in this direction as "A Connecting Link." A short synopsis of it may speak for itself. It tends to children's educational joy, and their judgment goes gratifyingly in my favor wherever they glance at it.

E. M.

San Francisco, *November*, 1890.

THE MOTOR FORCES

OF

MANUAL TRAINING.

The noble structure of earnest devotion to the educational needs of humanity stands on its broad platform, unique in its reformatory power, under the simple name "Kindergarten."

Not as a remarkable outgrowth of the American soil; but in the extent and rapidity of its growth in America, it has no parallel. The independence, the generosity, the devotion, the wealth, the republican spirit, and, above all, the clear recognition of cause and effect of the American woman, have promoted this process.

Hardly two-score years have passed since our venerable friend, Miss E. P. Peabody, sent the glad tidings from Europe to her sister, Mrs. Horace Mann, of the work of the great educational reformer, Friedrich Froebel, urging the immediate introduction of his teachings into this country. This demand was met by a few German kindergarten trainers. But it was Susan Blow of St. Louis, an American lady of wealth and high culture, who first connected Froebel's educational system with our public schools. Capable of personally conducting her free training schools, and, aided by the philosophic and practical insight of the city school superintendent, W. T. Harris, she saw her work crowned by the success of sixty free kindergartens at once connected with the public schools of St. Louis. The exhibits of kindergarten work, and an actual kindergarten at Philadelphia in 1876, showed American readiness for the conception of a more rational development of the children of the Nation. Against opposition and lethargy, criticism and indifference, the highest inspiration and self-denial battled bravely until public opinion was conquered by the unshaken mental and practical influence of the motherly power in the virgins of America. The loving charm of the virgin, her devotion and thoroughness, gave the method of Friedrich Froebel its foothold, and, it is to be hoped, its indestructible power. Even the learned teachers in the National Teachers' Conventions consented to make room for the work of the five and six years old school laborers. Notwithstanding these efforts, it needed ten years'

hard labor and an outlay of almost a million dollars before Mrs. Quincy Agassiz Shaw and her associates succeeded in inducing the school board of Boston to adopt the kindergarten as a part of public instruction. It would be erroneous, however, to accept the work thus far accomplished as work completed. The great truth of a natural human development *does not end* with the kindergarten—it rather *begins with it.*

PLAY IN WORK AND WORK IN PLAY.

No one denies that childish play is not devoid of labor. On the other hand, it is generally admitted that play and labor are so closely united, in their two-fold nature, that it is difficult to separate them. Nay, more, we have learned to respect and promote their combined physical effect as a natural requirement of the child as it is of the man, proving that labor does not burden if a free and spontaneous activity is allowed. For instance, an artist does not feel his labor to be a burden, because his work comes freely and spontaneously to him. The truth of this fact is laid down most convincingly in the open letter of Dr. Oscar Browning, of Cambridge University, England, in favor of Frœbel's principles of education. He says he noticed the exactness with which a boy was able to give an account of the details of a cricket match, although it had lasted for hours, and had consisted of many complicated incidents, a proof that his power of memory had increased in the ratio of his joy, because delight and animation had been associated with free mental activity. Thus, illustrating a fundamental principle of Frœbel, Mr. Browning continues: "If we are obliged to acknowledge Friedrich Frœbel's method of education and teaching as appealing most to the universally ruing laws of nature, then the consideration of a difference inage is quite removed, and I see no reason why it should not possess equal vitality in our universities." Of all that man owes to Friedrich Frœbel, the educational application of this principle to early childhood is recognized as most fundamental to its development. It was this development in its natural needs which drove Frœbel into the humble hut of the peasant mother in Thuringia. Here he found, in the simple means of play-work, the childish sympathy of a mother's heart yet untouched by artificial impressions, and these means, discovered through the impressions of nature, bear its character and manifest the fundamental truth.

Frœbel's first play-tools for the baby represent this fundamental truth in form, color, and motion. From this stepping-stone he gives a variety of experiences, which, in sympathy with childish activity, furnish unconsciously a first and ever-

lasting conception of truth. The reproduction of these impressions as free manifestations of the creative activity of the child turned into educational labor presents but the embodied logic of Frœbel's system, using the self-activity of the child which develops itself from within.

THE MANUAL LABOR REFORM IN GERMANY.

Psycho-physiological education brings Frœbel's method with renewed force to the front. No leader of a so-called "manual-labor school" in Germany (Directoren der Handfertigkeits-Schulen) fails to regard Frœbel's requirement for "knowing by doing" as fundamental to the universal requirement of a reform in all grades of instruction. The existing manual-training schools are the outgrowth of Frœbel's principles ripened, after the experience of twenty years, into their present universal aim. The petition to this end presented to the Reichstag in Germany had the full sanction of Prince Bismarck, who granted 5,000 marks to the undertaking through the minister of public instruction. This petition was signed by more than seventeen thousand of the most distinguished men of all classes, and was supplemented by a special appeal from the commission on school matters of the academic association (Die Erweiterte Schul Commission der Deutschen academischen Vereinigung).*

Lectures by men of all classes have been given. Exhibits by the teachers and pupils of the different manual-labor schools have promoted this cause.

These labor-training schools, as far as they have been introduced, are the work of an extensive association for mutual support, though the schools, individually, are independent of each other.

Their leaders recognize the necessity of providing early childhood with a well-arranged preparatory course of work, fundamental in principle and method to the higher grades, in manual dexterity.

They agree that this preparatory course must be undertaken by young, professionally-trained women, whose motherly power and cheerful influence will turn the happy school-work hours into a continued delight in home labor, thus uniting parent and child in work and happy satisfaction. To this end the seminary for the teaching of manual labor at Leip-

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*The reports of '89 to '90 show a marked increase of teachers taking courses in manual-labor schools, and the same may be said about the "Knaben horsts."

sic, under the directorship of Dr. W. Goetze, has of late admitted ladies. The course is a short and inexpensive one, and occurs in the season of general vacation.

The course lasts from April 25th to August 21st, and embraces: (*a*) *Paste-board work;* (*b*) *carpentering;* (*c*) *wood-carving* (Kerbschnitt); and (*d*) *metal-work.*

Four English ladies attended this course recently. (Twenty ladies went to Copenhagen for the same purpose.) Men students, of every nationality except American, have entered the course.

The pioneer worker in manual dexterity, A von Clauson Kaas, has opened a similar institution for ladies at Dresden. His course gives instruction in *wood-work* (joinery, wood-carving), scroll-work, inlaid-work, and picture-burning on wood, in *paper and paste-board work*, paper-cutting, and bristol-board work, *pressed-leather work*, *cork-work*, *and modelling.*

The extensive and valuable course of the manual-labor school connected with the Vienna public school (Buergerschule) under their enthusiastic director, Alois Bruhns, demands that the boy of nine or ten years old should possess a certain degree of manual skill in order to be able to fashion the material with which to experiment. Mr. Bruhns says:

"Normally endowed children try to busy themselves as much as possible, physically, to give reality to their thoughts."

What else is the play of children than the endeavor to give practical expression to their world of thought? When the child comes afterwards into the public school, and the instruction there progresses suitably and successfully, this endeavor continues, although usually in a more limited degree, according as the opportunities of instruction permit; the child tries to draw, calculates and measures all possible objects, and even tries to represent, with the help of its comrades, the stories which it has heard. How often one child asks another, for instance, to play Little Red Riding Hood, saying, "You be the wolf and I will be Little Red Riding Hood."

When the child gets into the higher classes, where he studies the exact sciences, he tries to reproduce at home what he has seen at school; he experiments.

If a child does not do this it is either because of a diseased development of the body, or because *the instruction has given him no clear ideas, so that he becomes discouraged with his first attempts, and loses the desire of putting his thoughts into practice.* It is only success and the attainment of results that give encouragement, which finally develops energy.

What has been said being admitted, we may assert that it instruction is to become more educational, and if it is to wake up and develop all the slumbering powers in the child, if must include physical work within its scope.

This course indicates the limits within which physical work should be pursued by whatever *pedagogy* has recognized as the essential and correct thing for the several stages of instruction and education—that is, it has to adjust itself to the real and proper world in which the child lives and to give practical shape to its thoughts. Instruction in manual dexterity should, therefore, as far as it falls within the time in which the child is undergoing school instruction, be strictly confined to these limits. Bringing in foreign objects, which are not connected with the work, tears the child out of its own world, withdraws it from its unitary development, and overburdens it with double mental work, if the instruction in manual dexterity does not become a mere mechanical drill.

The question might be asked here, whether our theoretical instruction has any need of being supplemented by physical work? It would carry us too far to answer this question for every stage, so we have given in the following only a rapid review of the requirements of instruction in the upper grade of public schools at Vienna, for industrial purposes, leaving out the subjects which contribute only to culture, such as writing, singing and athletics.

NATURAL SCIENCES.

Object: Knowledge of the most important physical and chemical phenomena, based principally upon experiment, with continual regard to the requirements of town life, knowledge of the fabrication of the most important products of industry, with especial regard to those which are of the most importance locally.

FIRST CLASS—TWO HOURS A WEEK.

Forms of connection of bodies, cohesion; kinds of solid bodies, adhesion and capillary phenomena, impenetrability, divisibility, porosity, weight, comprehension of absolute and specific weight, density.

Expansion of bodies by heat, thermometer, expansion of water, expansion of air, draughts of air, wind.

Magnetic attraction, natural and artificial magnets, polarity, construction of artificial magnets by stroking, distribution of magnetism.

Fundamental phenomena of electricity, electroscope, good and bad conductors of electricity, electrization by communication and distribution, electrizing machines, leyden jars, galvanism, voltaic battery, electric current.

Bottom pressure and side pressure, vessels of communication.

Air pressure, barometer, siphon.

Production and propagation of sound, kinds of sound.

Luminous and non-luminous, transparent and opaque bodies, rectilinear propagation and rapidity of light, shadows, strength of illumination (depending upon the angle of incidence), reflection of light, the plane mirror.

Water, decomposition of water by the electrical current, hydrogen and oxygen, chemical decomposition, oxy-hydrogen gas, mixture, chemical combination, atmospheric air, essential constituents of air, nitrogen, carbon, sulphur; phosphorous matches; chlorine, disinfection; iodine, bromine, elements, analysis.

SECOND CLASS—TWO HOURS A WEEK.

The subjects of instruction of the first class are reviewed with the several chapters, and are carried farther:

Conduction of heat, good and bad conductors of heat, change of forms of aggregation of bodies by heat, melting, congealing, crystalization; evaporation, vaporization, distillation, sublimation.

Magnetic needle, declination, compass, inclination (dip), terrestrial magnetism.

Electrophore, atmospheric electricity; ozone, thunderstorms, lightning-rods; the most frequently applied galvanic batteries, physiological, thermal, illuminant and chemical actions of the galvanic current, galvanoplastics.

Center of gravity, kinds of equilibrium, stability, lever scales; roller, pulley; arbor, wheel.

Equilibrium and motion, inertia, uniform motion, comprehension of mechanical work, measurement of mechanical work, pendulum, clocks, oppositions of motion.

Propagation of water pressure, hydraulic press; loss of weight in water, swimming, determination of specific gravity, hydrostatic balance, aræometer.

Air pumps, loss of weight in air; air balloons, bellows, suction and force pumps, Heron's German ball, fire-engine.

The most important sonorous bodies, rapidity, and strength of sound; reflexion of sound, echo, reverberation, harmonics.

Curved mirror, refraction of light, optical lenses, dispersion of colors, spectrum.

Lime burning, caustic lime; carbonic acid, carbonic oxide, saltpetre, nitric acid; acids, bases, salts (in the chemical sense), sulphurous acid, sulphuric acid, phosphoric acid, muriatic acid, fluoric acid; etching of glass, ammonia, sulphuretted hydrogen; dry distillation, heavier and lighter carburetted hydrogen gas, fire damp, safety lamps, coal, illuminating gas, combustion, potash; soda, lye, borax; silicic acid, glass, metals, magnesium, aluminium, clay, porcelain, iron, lead, tin, zinc, copper, mercury, and silver, alloys.

THIRD CLASS—THREE HOURS A WEEK.

The subjects of instruction of the first and second classes are reviewed and carried farther:

Radiation of heat, sources of heat, heating value of combustible materials.

Laws of vaporization, humidity of the air, fog, clouds, rain, snow, hail, dew, hoar-frost; elasticity of water-vapor, steam-engines.

Magnetic effects of the galvanic current, telegraph, induction of electrical currents, telephone.

Inclined planes, wedge, screw, free fall, projectile motion, central motion, centrifugal force, water-wheels, grist-mills (water-mills and wind-mills).

Vocal and auditory organs of man, hearing.

Strength of light, illuminating value of illuminating materials; the human eye, sight, spectacles, microscope, telescope, photography.

Getting iron out of the ores, blast furnaces.

Carbohydrates, spirituous fermentation, spirits of wine, spirituous beverages, acid fermentation, acetic acid, vinegar making; verdigris, detection of verdigris in foods; putrefaction and decay, carbonization, fats, glycerine, fatty acids, and other important organic acids, stearine candles, soaps, some resins, and ethereal oils.

Tanning, coloring materials, and some of the most important colored goods, dyeing, calico printing, bleaching, albumens, glues, foods, preservation and falsification of foods.

(This curriculum embraces the age of 10 to 14 years.)

SCHOOL REFORMS IN AMERICA.

The necessity for a similar reform is felt by the educators of America, and steps have been taken in Boston to form a National Association of those who believe that extensive

modifications of the traditional curriculum in the direction of kindergarten, tools, modeling, drawing, form, and color, cooking, sewing, and elementary science, in most or all these branches, are required for the good of both the scholars and the schools.

To this end the association proposes to unify the various departments of educational work from the kindergarten upward; to study the fundamental principles of education; to originate such a system as shall harmonize methods of instruction and training, and make them more effective in public and private schools.

The following-named gentlemen have been elected officers of this association: G. Stanley Hall, President; McAllister, Melleney, Murray Butler, School Superintendent Edwin Sewer, of Boston, and others.

At the same time it may be mentioned that the following resolutions were passed by the convention of German-American teachers, at Buffalo, in 1885, to the effect that—

1. The schools should harmoniously develop the pupil's whole nature; his knowledge should be broadened, elevated, and strengthened; his will regulated, and his sense of the beautiful encouraged.

2. Work should be introduced into the school as a new and important factor in the attainment of these purposes.

3. The hand should lead the mind and the mind the hand.

4. Work should supplement instruction in athletics, and serves as gymnastics for the hand and eye.

5. Work and the school work-bench must act morally on the children, and adapt and attract them early to friendly and combined working and doing.

6. Work should serve as a compensation for bodily and mental activity, and have a freshening and enlivening effect upon instruction.

7. Work is necessary to the educator for a better acquaintance with the scholar, and foreshadows more distinctly the way along which he should lead his pupil.

8. By the school's esteem for work the workman's ambition will be awakened in the child.

9. Skillful workmen will be trained, who will be fitted both to do a higher grade of work and to demand a higher price for their labor.

10. By the introduction of work into the schools a way will be opened for the social elevation of the masses.

The problem of the continuity of human development in its philosophic conception from the Kindergarten to the Manual Training School, is of recent date. Our teachers

hardly realize the necessity for a professional training in order to teach the alternating culture of the head and the hand. This desideratum can no longer be deferred, for it constitutes not only the fundamental aim of the desired school reform, but is a problem of grave, social, and national economy. It presents the question:

Shall the child continue, without interruption, its three-fold development as begun in the kindergarten?

That is to say, by a self-activity encouraged gradually and systematically when the life's habits are being formed, by joyful creative occupations, which lead "through work to work" in its highest moral sense, and this at an age when the whole nature demands work; or,

Shall we systematically pervert and destroy all that has been accomplished by the kindergarten system by failing to form and control the child's life-habits through the continuation of Froebel's developing principles?

Shall we not rather seek for a "Connecting Link" to connect the kindergarten with the primary department, introducing educational labor methodically and gradually, thus becoming the leading nation in this rational reform?

The money furnished for industrial education by our wealthy philanthopists will not accomplish this work of reform unless Froebel's kindergarten method is accepted as a fundamental basis. That means either by elevating labor to its ideal, or by merely facilitating and lessening the burden of labor to humanity.

Ruskin and Canon Farrar represent the advocates of ideal education in England. Farrar says, in a lecture before the "London Society of Art": "Each neglect of art, imagination, and the creative power of the child as a means of education, must carry with it great drawbacks. We give early instruction in writing, reading, and arithmetic; but the far more important development of feeling and understanding of all that is beautiful and true is shown to be completely neglected."

It is deeply to be regretted that these valuable opinions stand in direct opposition to the growing disposition in England to introduce labor in early childhood as a means of training toward mere utility. This might be permissible if it did not lead to the erroneous conclusion that the undeniable merits of utility do not suffice for the harmonious, three-fold human development of the head, heart and hand for which we are seeking. This error has misled even prominent disciples of Froebel to see manifested in the Slöyd system and its use, on the joiner's bench, the solution of the educational value of labor.

Similar danger lurks around our own doors. The revolutionizing principles of Frœbel's method have not sufficiently permeated our primary development, so as to demand and furnish a full course of kindergarten method throughout.

No doubt our normal schools will continue to respond to this need as rapidly as they have begun. Should this be accomplished, the American nation can now hardly realize the advantages it will possess in this particular over all other nations.

America offers advantages in kindergarten training that are found nowhere else. The German kindergarten system admits the student at the immature age of fourteen, whereas the American normal-class pupil seldom enters under eighteen years of age. This maturity, together with the free training and its underlying culture (provided ample time and opportunity are afforded for thorough theoretical and practical training) afford the greatest inducements to the study of Frœbel's system.

The general disposition to furnish the primary school department with exercises in manual dexterity (which should be nothing else in character but the extension of the kindergarten), as before stated, evince the recognition of the necessity of training of adequate teachers.

A special teacher will be needed for the direction and supervision of the primary practice department of every normal school. This teacher may instruct the pupils of the normal school as well as those who may be desirous of taking a special course. The encouragement of a continuance of salary during leave of absence would add to the teacher's zeal.

THE CONNECTING LINK

INTRODUCES THE

KNIFE FOR CUTTING PAPER AND WOOD.

Comparison and Forms of Contents.

The folding and cutting of paper with the scissors is a familiar exercise in the kindergarten and develops, like other occupations of Froebel, in three directions: in the understanding of forms of knowledge, or of space and contents, of forms of beauty and of forms of life.

Franz Hertel, director of the Manual-Labor Training School at Zwickau, combines this useful occupation with the drawing from objects instead of special patterns, recommending that the result of the child's efforts should be kept in drawing books, to serve as an exhibit of progress.

The new feature of Hertel's work lies in the systematized use of the knife instead of the scissors, as in the kindergarten, thus forming the intermediate step toward the cutting of wood and paste-board.

Both these occupations afford ample scope to the child in the full expression of form-language, in creativeness and designing. It should be the chief aim of all play-work in early childhood, to afford the child that amount of glee and happiness which is its prime right toward a normal healthy condition. The attractiveness of the objects and their connection with the surrounding world in which the child lives, the cheapness of the material, and the simplicity of the tools, give this whole method an inexpressible superiority of adaptation as the "Connecting Link" between the kindergarten and the Manual Training School.

The beneficial effect of the deductive method on the young mind is a practical surprise to the thoughtful educator. In clear perception of the simple fundamental knowledge of things in a sympathetic playful direction of the older playmate (the teacher), the child will acquire a wonderful power of association of ideas and conclusions. The mental development in the kindergarten is mainly due to the deductive process, and will continue to be the source of spontaneous

inspiration, if continued through the school grades. "Don't tell me!" exclaims even the youngest of the young when bent on solving some difficulty theoretically or practically.

Practical Hints.

Furnish the child with one sheet of white and two sheets of stiff colored paper, each of four inches square, with which to illustrate similarity and dissimilarity in form and contents. The child uses the ruler and knife to separate the desired parts. This exercise teaches not only the discriminating of shapes and contents, but also of fractional parts.

While the knife gives easy exercise preparatory to the more difficult work of wood-cutting and paste-board work, the accompanying chart may suffice to make this system perfectly clear; but for the less experienced the following few words of direction may not be amiss, especially as it is intended to illustrate the deductive method by which self-help may be developed in the child. Experiments that have for years been made in the writer's own school, prove that this method is not only possible, but easy.

Analytical Comparison.

Having developed the understanding of a straight line which might logically be derived from the previous use of the curve (see Emma Marwedel's "Circular Drawing System"), the square, and the oblong, it will be easy to lead the child to a clear idea of the wholes, halves, and quarters and the multiplicity of corners and their inside points, called angles.

Fundamental Knowledge of Things.

Fundamental knowledge of position, direction, and dimension, by means of measurement and the accurate use of terms, have not been enough considered in their practical value in the kindergarten or in our public schools. Modern education begins to lay great stress upon the necessity of impressing the child with the full meaning of terms and their connection to its environment, requiring accurate description and comparison of objects in the child's own words; thus making him, so to say, self-training in thought and reason, and preventing him from stringing words parrot fashion.

Exercises in Drawing Lines.

Lines may be drawn by the use of the ruler, by the aid of dots to be connected, and by using the eye-measure only.

Exercises in Cutting Straight Lines.

It is necessary to follow, first, lines of ruled paper carefully with the knife, using the right and left hand alternately, to prevent one-handed development. This should be practiced until a cut can be made which leaves the edges perfectly smooth and straight.

PLATE I.

On the whole, it is expected that the following directions are sufficient to enable teacher and pupil to produce the forms described. If not so, please address Emma Marwedel, San Francisco, and the forms will be sent for a nominal price cut in stiff paper.

Do not neglect to furnish two or three harmoniously blending papers, and allow *tasteful* ornaments by drawing.

1. Exercises by cutting strips of equal size till they are perfect.
2. Use the strips to lay down a figure of four equal sides.
3. Ask name of the figure.
4. Cut the same number and size of strips.
5. Produce of them *two* equally-shaped and equally-sized figures of four sides.
6. Ask name of the figure.
7. Let similar figures be found in child's environments.
8. Compare similarity and dissimilarity between the square and oblong.
9. Refer to the *general* and *special* qualities in condensed and practical terms, and avoid the taught terms, as form, corners, edges, angles, etc.*
10. Draw both figures in a drawing book, marking the division by the strips.
11. Let some of the children state what they see, in all details.

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* In my kindergarten and school the clear conception of those qualities belonging to all objects called general qualities was experimentally realized—(see "Conscious Motherhood and Childhood's Poetry and Studies of Life and Form," by E. M., San Francisco, and D. C. Heath, Boston, Mass.)—as having matter, form or shape, color, and extension in three directions, taking space, and depending on the law of cohesion. Reference to these parts—as general qualities belonging to all objects, and special qualities of each object—formed habits, leading the youngest child to classification and a logical discrimination between all objects—carrying an undeniable aid to a clear perception of all later studies and to expression of judgment and thoughts. It is a very strong, yet neglected, demand of Frœbel's method.

12. Compare the expressions and call for the judgment of the children upon them.

13. Have the best statement put on the blackboard by a child; correct spelling.

14. Have it written in the drawing book. (This deducting, descriptive, or Socratic method proved a marked success in Miss Marwedel's kindergarten and school—joyful rivalry, fostering pleasant animation and critical discrimination in judgment and exact language.)

15. Cut seven equally-sized squares; form them in two squares.

16. What happens?

17. Cut three small squares.

18. Join them to form a square.

19. What happened in either of these two cases, and how much is wanted to form three squares?

20. How much of *a whole* square have you in either case?

21. How do we call such parts of a whole?

22. Have stated what seen.

23. Compare what is seen in the two figures.

24. Criticise language.

25. Correct on black-board.

26. Draw in book, with best description.

27. Cut a square from corner to corner through the middle.

28. Ask name of these figures.

29. Lay down a square and an oblong; compare with one and two triangles of the last square.

30. Have stated what was seen, using the proper names.

31. Criticise language.

32. Correct on black-board.

33. Draw in book with best statement.

34. Cut square diagonally and once through the middle.

35. How many parts have you?

36. How much does each part present of the whole?

37. Is a new form introduced?

38. State, criticise, correct, and draw.

40. Cut a square, its contents consisting of two squares, besides leaving how many eighths?

41. Cut a square with four right angle triangles, the right angles meeting in the center. (Have two sheets.)

42. Compare the last two squares.

43. State, criticise, correct, and draw.

44. Cut four half triangles out of two squares.

45. Place them in an oblong of paper, divided by a line horizontally.

46. Join the longest side of the triangle middle to middle with the horizontal line.

47. Right angle upwards.
48. Join another triangle to the left, acute angle to acute angle.
49. Join the acute angle of the third triangle with the middle of the base of the first triangle laid down to the left, right angle downwards.
50. Join the fourth triangle, right angle downwards, acute angle to acute angle to the left.
51. What forms and how many of each kind do you perceive in square measurement?
52. How much does each present of the whole?
53. State relation to each other.
54. Describe the new form you see.
55. Discuss statement, correct, draw and write.
56. Divide square in two oblongs.
57. Cut triangle half the size of oblong.
58. Join its base to the left hand edge of the square.
59. How many parts do you see? How do they differ in shape?
60. Repeat same figure in square instead of oblong, two triangles, joining base to base in middle of the square.
61. Describe the new form you see.
62. Ask name.
63. State its contents.
64. How many parts have you of each?
65. State similarity and dissimilarity between the two last figures.
66. Discuss and correct statement, draw and write.
67. Cut square, divide in two oblongs by horizontal line.
68. Divide one of the oblongs by slanting cut from the right hand upper corner of the oblong to the left hand lower corner. (Don't forget that two squares are in operation.)
69. Describe the new form you see.
70. Ask name.
71. State its contents; compare scalene triangle with right angular triangle, oblong and square.
72. Cut squares.
73. Cut four scalene triangles.
74. Place two of them in square with right angles in the left side upper and lower corner.
75. The other two right angles joining to middle of the right hand edge of the square.
76. Construct a strictly opposite figure as regards position.
77. Compare the two figures in similarities and dissimilarities.
78. State parts and contents.

79. Discuss and correct statement, draw and write.
80. Divide square by line horizontally.
81. Cut one oblong in two scalene triangles.
82. The other by a horizontal cut.
83. State difference of forms and contents.
84. Use three squares always.
85. Divide by horizontal and vertical lines.
86. Cut two joined scalene triangles in one piece.
87. Place middle to middle in square.
88. What do you see?
89. Ask name.
90. State difference of forms and contents.
91. Find the opposite of this form.
92. Compare the two figures.
93. Discuss and correct statement, draw and write.
94. Cut a square, divide by horizontal line.
95. Place an equilateral triangle middle to middle from the left hand edge.
96. Divide the rest of the square into two scalene and two equilateral triangles.
97. What are the contents?
98. Divide each of these parts in halves.
99. How many parts have you?
100. What part of the whole do they present, fractionally expressed?

Any teacher will be able to extend these exercises.

Ornamentation by drawing and harmonious combinations on the laws of æsthetics should be educationally considered.

A dozen sample forms may be received by sending 75 cents to Miss Emma Marwedel, San Francisco.

PLATE II.

Cutting geometrical forms of stiff paper with the knife, preparatory to Industrial Arts.

Developing: Skill, steadiness of the hand, conception of harmony and beauty by models, to be analyzed and discussed, leading to free production—excluding dictation or copying—power to express that which is seen, by drawing and coloring, and individually spoken and written language.

Each form composed of three or more colors, the analysis of geometrical diversities becomes a very attractive, instead of, as hitherto, a dry study, while individual changes offer an endless variety to serve as an instructive home pleasure.

A sequence of Frœbel's paper folding, the observing and comparative faculties of the child are directed to an indi-

vidual construction of certain combinations with the special view to harmony and beauty. For instance :

1. Produce a figure in three colors, forming a large equilateral triangle, presenting in its centre, likewise, a smaller equilateral triangle, surrounded with three scalene triangles—the rest of the space divided by six equilateral triangles.

2. Produce a figure in three colors, presenting a hexagon. How many equilateral, and how many scalene triangles are needed, and in what relation stand the two to each other to show in the centre a circular form, divided in twelve parts, radiating from the centre. Describe the figure.

Linear divisions of the square, twisted in and out, produce charming effects, teaching to ornament the paste-board work. Compare the different inventions of the child from an æsthetical point. A dozen sample forms may be received by sending 75 cents to Emma Marwedel, San Francisco. Cal.

PLATE III.

Cutting ornamental borders of stiff paper with the knife, to be used for ornamentation on paste-board work.

A dozen sample forms may be received by sending 75 cents to Miss Emma Marwedel, San Francisco.

WOOD-CUTTING

IN A

GRADED SERIES OF FORTY-TWO MODELS.

"Of all teachers who should be visited," said Dr. W. Gœtze (Director of the "Handfertigkeits" Seminary at Leipsic), "Miss Eva Rodhe deserves the first place. She is a 'true teacher, von Gottes Gnaden,' as we Germans say. She preaches the gospel of a happy childhood, not merely by words but by language of the heart which creates life and joy where the every-day human being finds only insurmountable hardships and impossibilities. Miss Rodhe has proved her knowledge of child nature by introducing familiar forms in work, representing toys and the forms of life and of its environment, in exclusive preference to dead geometric combinations, thus establishing a link between the school and the home—between labor and enjoyment—whereby the combined interest of parent and child is greatly increased.

Miss Rodhe is the very life-source of the "Connecting Link." She kindly furnished the writer with the patterns for wood cutting on the accompanying plates, which will be supplied as a completed series in wood to schools ordering them.

To those who may doubt the possibility of such practical results being accomplished by young children, the writer may state that she has seen similar work, made from old cigar boxes, in Berlin, at the kindergarten of Frœbel's niece, Mrs. Henrietta Shrader, president of the Pestalozzi-Frœbel Association.

DESCRIPTION OF THE ACCOMPANYING DRAWINGS.

General Remarks.

The figures illustrated in the accompanying drawings are a few forms which may be used to illustrate this system, and the teacher may invent other forms, those shown serving as models. As it is the object of the system to teach children the use of their hands in manipulating wood, the figures to

be made by them should commence with the elementary form of nature (a circle), and gradually work up to one more complicated and composed of several parts, which are loosely joined together. The figures as shown are two-thirds of the size they should be made.

Material.

The wood used should be one which is soft, not easily split, and cheap, such as white pine or cedar. The latter may be obtained from old cigar boxes, the nails of which are also admirably adapted for fastening several pieces of the wood together, when any such fastening is required, as they are generally round and of the same diameter from head to point, and will not, therefore, split the wood. If in any case it should be necessary to buy nails they may be obtained at hardware stores under the name of "wire" nails, No. 18, this size being about the proper length. The wood should be planed smooth on both sides, and should be about one-eighth of an inch in thickness. In Mrs. Schrader's intermediate class a paste of clay or plaster of paris is put on the wood of cigar boxes and, when dry, rubbed off with sand, sandpaper or glass till smooth.

Tools.

The most important of the tools is the knife, which should have a sharp edge, and, if the age of the child permits, a sharp point also, which may be used in making holes in the wood when the holes are required to be of a larger size than can be made with the awl. A brad-awl, which may be bought in any hardware store for a few cents may be found useful in making holes for the insertion of the nails, especially when the latter are to be used as pivots upon which parts turn, as are the nails in figure 17. The diameter of the awl should be about equal to that of the nail, and the advantage of its use is that it will make a hole in the wood with less danger of splitting it than will the latter.

Operation.

The teacher should draw upon the wood the outlines of the figure to be made by the pupil, or if the figure consists of several parts, the outline of each part, taking care to have the greater length of the figure run in the same direction as the grain or fibre of the wood. If, in any case, a hole or recess is to be made in the wood, it should be made before the out-

line is cut out, as there is then less danger of splitting. If the hole is intended for the reception of a nail, and a brad-awl is not at hand, the nail may be driven in and then withdrawn leaving a hole where it has been, and in which it may be afterwards placed. If a recess, such as the recess *a*, in figure 9, is to be made, a small hole should first be made with the point of the knife and enlarged with the edge. This having been done, the pupil should follow the outline drawn by the teacher, cutting off the superfluous wood with the knife, after which the work may be finished smooth by rubbing with sand or emery paper of medium coarseness. If the figure consists of several parts, all the parts should be finished as above described; and if any are to be nailed together, the nails should be carefully driven in the holes previously made for their reception. If the nails project through the wood, their points should be bent over and rest against the side of the wood. When driving the nails the wood should rest upon a solid base. Also, the design in paper may be pasted on the wood.

I.—Figures Made of a Single Piece.

Figure 1.—A circle. The outline being drawn by the teacher, the pupil should follow the outline with the knife, as above described.

Figure 2.—Hand Mirror. The hole *a* should first be made with the point of the knife, and the outline then made as in figure 1.

Figure 3.—Egg (ellipse). To be made in the same manner as figure 1 (compare circle and ellipse).

Figure 4.—Square. To be made in the same manner as figure 1.

Figure 5.—Butter Paddle. To be made in the same manner as figure 2.

Figure 6.—Parallelogram. To be made in the same manner as figure 1 (compare square and parallelogram).

Figure 7.—Head Stone, showing combination of figures and 6. To be made in the same manner as figure 2.

Figure 8.—Paper Knife, showing combination of curves. To be made in the same manner as figure 1. When the pupil is more advanced he may ornament the handle, *a*, by making lines of small holes, *b*, with the point of a brad-awl or a nail. The lines may be made to assume fanciful forms or may serve as lines to define the different parts of the figure.

Figure 9.—Trellis for flowers. The recesses, *a*, should be first made as described, and then the outlines cut as in figure 1.

Figure 10.—Leaf. The pupil should first cut out the outline as in figure 1. When he has done this, he may cut with the point of the knife channels, *a*, in the wood, representing the veins of the leaf. It is desirable that the pupil copy the different varieties of leaves from nature.

(This would point out at once the Botanist or Zoologist.)

Figure 11.—Fish. To be made as figure 10, the channels, *a*, representing the markings upon the fins, etc. Small depressions, *b*, may be made in the wood with a brad-awl or a nail, as in figure 8, and will serve to outline the different parts of the body, while a larger depression, *c*, may be made in the head with the point of the knife and serve to represent the eye.

Figure 12.—Crocodile. To be made as in figure 11.

II.—Figures Made of Two or More Pieces of Wood, Rigidly Joined Together by Nails, or by Mortise and Tenon Joints.

Figure 13.—Mortised Frame. Two pieces, *c* and c^1, of the outline shown in figure 13*b*, should be made. One of the pieces, *c*, should then have a slot, *d*, cut in its central portion, commencing at its top, while the other piece, c^1, should have a corresponding slot, d^1, commencing at its bottom. In either case the slot (*d* or d^1) should have a depth (*ed* or ed^1) equal to one-half the breadth (*fd* or fd^1) of the piece (*c* or c^1) at the point where the slot is cut, and the width (*gd* or gd^1) of the slot should equal the thickness of the wood. When the pieces (*c* and c^1) are in the position shown in figure 13*b*, and are brought together they should assume the form shown in figure 13*a*, the top and bottom of each piece being even with the top and bottom of the other.

Figure 14.—Table. When the mortised frame shown in figure 13 has been made, a cover, *h*, may be nailed over its upper surface. The cover may be ornamented by holes, *i*, cut with the point of the knife, if desired.

Figure 15.—Rake. Two pieces of wood (*a* and *b*) should be glued together (with mucilage if glue can not be had) with their fibers crossed. The outline of the rake should then be drawn and a series of holes made with a brad-awl in the cross-head, *c*, of the rake to receive the nails, *d*, which form the teeth. The outline should then be cut and that one of the pieces of wood, *b*, whose grain crosses the direction of the handle, *e*, of the rake from side to side should be cut off at *f*, and broken away from the handle, thus leaving the latter of the thickness of the piece, *a*, while the cross-head, *c*, is of

two thicknesses, *a* and *b*, the fibers of which cross and prevent splitting. The nails, *d*, may be now inserted in the holes, *c*, previously made, having their heads on that side of the wood which forms the back of the rake.

III.—Figures Made of Two or More Pieces of Wood, Loosely Joined Together.

Figure 16.—Baby rattle. The outlines of piece *c* (figure 16*b*) having been drawn, the holes, *d*, should be made with the brad-awl. The wings, *e*, similar to the piece *c*, except that they have no handle, *f*, should also be drawn and have holes made in them; after which the piece *c*, and wings, *e*, should be cut out, after which one of the wings should be placed on each side of the piece *c*, and secured by cords, *g*, passing through the holes, *d*, and having knotted ends, *h*, the cord being loose enough to permit the wings to strike against the body, *i*, of the piece *c*, when the latter is shaken by the handle, *f*.

Figure 17.—Soldier. The piece *a* forming the body and the head, the two pieces, *b b*, forming the legs, and the two pieces, *c c*, forming the arms, should be cut out, after having first made holes with a brad-awl for the reception of the nails, *d* and *e*, upon which the parts turn. One of these nails, *d*, passes through the lower part of the body, *a*, and through the upper part of each leg, *b*, one of which is on each side of the body, and has its ends bent over, serving as a joint for the legs to move on. Another nail, *e*, passes through the body, *a*, and arms, *c c*, and serves as a pivot for them to move upon in the same manner as does the nail, *d*, for the legs, *b b*. A small piece of wood, *f*, shaped as a gun, sword, etc., may be inserted in a notch in the lower portion of one of the arms, while a small depression, such as *h*, may be made on the figure with the end of a brad-awl or the point of a nail, and serve to mark the position of the belt, etc.

Figure 18.—Wood-Sawyer. The piece *a* forms the body, a^1, log of wood, a^2, and saw "horse," a^3. The piece *b* forms the upper arm, and the piece *c* forms the fore-arm, c^1, and saw-frame, c^2, the recesses, *d*, in the several pieces *a*, *b*, and *c*, being made before their outline is cut out, as are the holes for the reception of the nails *e* and *f*. The upper arm, *b*, is fastened to the body, *a*, by a nail, *e*, passing through its upper end and through the shoulder of the body. The fore-arm, c^1, is secured to the lower part of the upper arm, *b*, by a nail, *f*, passing through the elbow. The saw-frame, c^2, and arm, *b*, may be thus moved back and forth, causing the latter

to move over the log a^2. As in the other cases in which nails are used as pivots, the nails, *e*, and *f*, should have their points bent down against the back of the rear piece through which they pass, which are, in the present cases, the body *a*, and arm, *b*, respectively.

Figure 19.—Horseman. Two pieces, *c*, should be made of the shape of the body of the horse, and a piece, *f*, of the shape of the tail while another piece, *g*, should be made in the shape of the horse's head and neck. The head and tail should be pivoted by nails, *h*, between the two sides, *c*, of the body at its front and rear, respectively, as shown in figure 19*c*, which shows one side of the horse and rider separated from the corresponding side, the said nails, *h*, passing through the sides, *c c*, and through the neck or tail. The hind legs are each made of one piece and each one is pivoted on the outside of one of the body pieces, *c c*, by a nail i^1, which passes through both the legs, *i*, through both body-pieces, *c*, and through a piece, i^2, which is placed between the body-piece to keep them apart. The front legs are each composed of two pieces, the piece, j^1, forming the lower part of the legs, and the piece, *j*, forming the upper part, the two being pivoted together by a nail, j^3. The upper part of the leg is pivoted to the forward portion of the body of the horse in the same manner as the rear legs are to the rear portion.

The rider is also composed of two pieces, *k*, between which is pivoted by a nail, k^2, a head, k^1, and a piece, k^3, projecting from the lower portion of the body, the free end of the piece k^3, resting between the body pieces, *c c*, of the horse, whereby the rider is held on. Each of the legs and arms of the horseman are composed of two pieces, *l* and l^1, and *m* and m^1, respectively, which are connected together in the same manner as are the front legs of the horse, each arm and leg of the horseman being attached to one of the body-pieces, *k*, as shown in figure 19*d*, which is a view showing figure 19*c* as it would appear if it were cut in half on the line *x x*. By moving the different pieces of which the man and horse are composed on their pivots, amusing effects will be produced, as will be seen by comparison of figures 19*a* and 19*b*.

Figure 20.—A figure *b* constructed as is the soldier (figure 17), except that his legs are made of two pieces which are pivoted together by a nail, has two holes made in the ends of his arms, *a*. Two pieces, *c*, which are connected near their middle by a brace, *d*, which is attached to them by nails, also have two holes in their upper ends. Through these holes, in one piece, a string is passed and twisted at *e*, then passed through the holes in the arms, *a*, and again twisted at e^1, and

then passed through the holes in the other piece, *c*. Now the lower part of the pieces, *c*, be alternately drawn together and released, the string will be alternately twisted and untwisted, causing the figure to jump, and forming a jumping-jack.

(*The cutting of wood to be continued and improved. Wooden samples can be had.*)

The Value of Instruction in Manual Dexterity as Regards Bodily Development and Hygiene.

A LECTURE

BY DR. BIRCH-HIRSCHFELDER.

ABSTRACT.

I speak as a physician, or rather as a medical schoolmaster. The physician looks at the question from two points of view: First, as it concerns the physicological development of man, including the development of the bodily functions in their relation to the mental. This may be called the *anthropological* point of view. Secondly, he considers in how far instruction in manual dexterity is of value for the healthy development of the body. This may be called the *hygienic* point of view.

Considered anthropologically, instruction in manual dexterity is pre-eminently adapted to the *education of the senses.* Though the education of the senses is so often advocated, I believe its full meaning has not always been fully comprehended. All education rests, from its positive point of view, upon practice—methodical practice. The development of the organs is promoted by orderly activity. Now, the education of the senses has two aspects; in the first place, it deals with the exercise of the *peripheral organs of sense*, the tools of the sense activity. For instance, we can educate the eye to measure dimensions better and to appreciate color impressions more exactly than is possible to the uneducated sense. The hearing, touch, and other senses can be educated similarly, but it would be a mistake to consider these *gymnastics of the senses* as the essential part of the education of the senses. The sense organ is an auxiliary of our mind; it takes cognizance

of external impressions, but the impressions are conveyed to the brain through the nerves. There are receiving stations in the brain for the separate nerves of sense, and these again are connected with the central station, where the sense perceptions pass over into consciousness. In this sense-practice the capacity of the peripheral brain stations to act upon those which are connected with the activity of the senses is exercised. But, of course, there are other connections between the central receiving stations in the brain and those portions of the brain which serve as the instruments of the higher mental functions. Here a central process takes place in connection with the sense-activity, and the *sense-impression* elaborated into an *idea* at the periphery becomes a mental possession. I believe that when the high value of the education of the senses is emphasized, this cultivation of the connection between the central sense station and those parts of the brain which subserve the highest mental functions, is meant.

We can acquire knowledge in two ways: First, through the word (verbal, symbolic impression); and, second, by inspection. Therefore, the aim of the education of the senses coincides with that which is called instruction by inspection. The great importance of this method of instruction by inspection is very familiar to us physicians. Our medical academical instruction will have no other. We can observe very frequently how mere verbal knowledge differs from that which is gained by inspection. For instance, one may learn a great many anatomical facts from a book, but, if he tries to make practical use of them, this mere verbal knowledge is found immediately to be wholly unfruitful. There are often in our classes (and partly in consequence of the whole direction of their preceding education and culture) a number of persons who are so accustomed to identify learning with verbal reception of knowledge, that they have no adequate appreciation of the importance of education by inspection. It is an important fact of experience also that even good illustrations are no substitute for the inspection of the object itself, but only of value in refreshing and fixing the memory of that which has been seen. But our experience carries us still farther. The exact knowledge of certain relations which is required of the physician can not be gained by the mere inspection of the natural object or preparation. Manual dexterity must be brought in as a means of instruction. It is only by the methodical dissection of the natural object that the learner gains that certain knowledge of shape and connection which fits him again to construct the demolished organism in his mind. The conditions are very much the same in instruction

in manual dexterity. For as the anatomist arrives at the clearest knowledge of the natural object by dissection, so the scholar learns to know most exactly the object which he constructs. Four stages of thorough knowledge may therefore be distinguished: (1) the knowledge of the object from a verbal description; (2) from a natural figure; (3) from the inspection of the object itself, and (4) from the personal *spontaneous* construction of the same. No other means can perfect the relationship between sense activity and the higher spiritual functions as well as instruction in manual dexterity.

Instruction has done but little, as yet, for the education of the senses. The only sense which has been given preference in this regard is that of hearing. Musical culture has not been neglected, but extraordinarily little has been done for the other senses. There are many more people who have learned to hear than of people who can see, who can observe. Right here, I believe instruction in manual dexterity can do a great work. It exerts muscular activity on the one hand; but, not as in athletics, a combined and more refined muscular activity is employed here for a definite purpose. Here also an important sense is exercised, namely, the muscular sense. The cultivation of skill in a matter which exercises the hands does not depend, for the most part, upon the increase of the strength of the muscles, but upon the finer cultivation of the muscular sense, which always, and, indeed unconsciously, informs us what the muscle is doing, and this muscular sense becomes exercised in a fine and many-sided way by suitable handwork. But in instruction in manual dexterity the sense of sight is necessarily exercised in a high degree, much more than in the single subject of instruction, which has hitherto worked in this direction, *i. e.*, drawing.

I do not mean by this to question in the least the great value of instruction in drawing; indeed I wish its value were more appreciated for the education of the senses in the courses of instruction in the higher schools. Nevertheless, I must insist that the material essence of the object is more fully comprehended by instruction in manual dexterity than by the symbolic reproduction in drawing. Here I do not take any account of mere artistic considerations, for, of course, in this regard no comparison can be made between drawing and the production of objects by manual dexterity. A celebrated sculptor told me himself that usually the experienced artist cannot model a simple object correctly from his memory. Making use of a trivial example, he said: "I could not even model a boot-jack correctly from my memory." But I believe that if he had made a boot-jack he would be able to model one

from his memory. This example may serve to show in what way I believe that instruction in manual dexterity is of much greater value than mere reproduction by drawing for the cultivation of the senses, and for that combined activity of the senses which fructifies in the favorable development of the internal activity of the senses.

The objection might be made that while it is true that the education of the senses is extraordinarily necessary, yet ordinary life gives of itself so many educational impetuses that it is not necessary for instruction to aim especially at this point. The first and most special answer to be made to this objection is that practice can produce no such effects in any other age as it can in the age of childhood; and that, therefore, putting off this education of the senses until a later period of development will entail a loss which can never be made up. And, furthermore, it is by no means true that the unmethodical exercise of the different senses has any such effect as to bring about that adaptation for sharp perception and mental elaboration of the impressions of sense which is desirable. Simple experiments with cultivated and uncultivated men of the different classes would demonstrate with surprising clearness that very few individuals who have not been exercised methodically in the proper direction are adapted to receive and elaborate the simplest intuitions of space.

By instruction in manual dexterity the different processes of the activity of the senses can be correctly carried on in a methodical way. Handiwork, cabinet-making, carving, etc., exercise the muscles, and especially those of the arms, in many ways, and at the same time give many kinds of practice in measurement by the eye. And here also, in addition, the higher psychical functions can be acted upon, and attention can very easily be called in the course of the work to the æsthetical side of the things which are worked upon. I will not go any farther into this. I believe you can, from your own experience, already supply sufficient material to demonstrate that instruction in manual dexterity is in the highest degree suited to exercise the activity of the senses methodically. And we shall make no mistake in asserting that the reaction of such a methodical exercise of the activity of the senses upon the higher mental faculties deserves especial appreciation.

There was a time when verbal knowledge, culture by words, dominated the mental world. The greatest change which ever was brought about in the history of mankind has been accomplished in the course of the last two centuries, and certainly because natural philosophy has been developed in a

way previously unanticipated. But natural philosophy rests, in its ultimate basis, upon *induction*. Proceeding from the observation of particulars (of occurrences under natural conditions or those determined by the observer), the inductive method leads to the knowledge of the natural law. The progress of the knowledge of natural law is promoted by the broader cultivation of method and by the perfecting of the apparatus of observation. Certainly, along with this is also to be considered the capacity of accomplishment of the sense organs and of the nervous apparatus therewith connected, which has been trained from youth and thereby perfected. The better schooling of the growing generation for the inductive method will be promoted when the influence of natural philosophy upon the farther development of mankind is recognized. Do not expect me to join those who refer all complaints about the deficient capacity for accomplishment of our generation, and its disposition to sickness, to the gymnasia, to the so-called *overburdening*. I do not believe in the overburdening in the sense in which it is many times entertained. I do not believe that our higher schools, in general, impose upon the youthful capacities absolutely too great tasks. But, nevertheless, a relative overloading frequently is produced, and that, indeed, by the one-sidedness of the practice. There is a lack of sufficient impetuses of compensation as an offset to the requirements which are not in themselves too high but yet are always one-sided. This lies many times in the modern formation of our lives, in the manner of life in the great city communities, in the many accessory claims which are otherwise made upon the time of the scholars. There is lacking that natural compensation for the evils of pure instruction by study which, under simple circumstances, in the country, in smaller cities, often comes quite of itself. For this reason, I believe, now there is so much the more necessity of emphasizing our duty, since the natural impetus of compensation is continually diminishing, to introduce something into education which, while promoting the mental development of the scholar, may also at the same time act as a means of compensation for the one-sided demands of instruction by study.

I said that the second point of view from which the physician regarded instruction in manual dexterity was the hygienic. If we can look upon three kinds of things as the aim of therapeutics in general, in the words of Bacon: "To lengthen life, to maintain health, and to heal disease," then the second, the promotion of the maintenance of health, corresponds to the contents of what is included in hygienics.

If we now ask in what way we can maintain health, there are only two ways possible: We can either *protect* the body from evils which threaten it, or we can increase and *exalt the resisting capacity of the body*. Every reasonable care of health must be developed toward these two directions. The mere following of rules which contribute to the protection of health would, in its ultimate consequences, lead to the most extreme effeminacy of mankind. If such a goal were practically attainable at all, the absolutely protected man would be deprived of the educational good influence which the struggle for existence exerts. Important for the *public health* as is the annihilation of evils which, for instance, can affect health in the dwelling or other environments of man, yet I consider the second aim, making the body more resisting to evils, as more important for the *health of the individual*, because this second aim presupposes directly also the highest possible activity of the man.

But how does the body and how do the several organs attain an exalted power of resistance against evils? There are three momenta which contribute to this. First, the resisting power of the single individual. The resisting power of each single organ depends upon inheritance, in a certain degree, upon the sum of capital which the individual man has brought with him into the world, which is due, in a great part, to his parents and ancestors. In the second place, this resisting power depends upon the *nourishment*. The nourishment depends upon the quantity and quality of the means of nourishment in the widest sense, including the air. But this certainly very important factor is not the only determinative one; for, thirdly, the power of resistance is detemined by the *activity of the organs*. Absolutely no normal development can be given to an organ, however well developed, an organism which might have the best and most favorable conditions of nourishment, if this factor of activity be left out. Every organism which is inactive, upon which therefore the physiological stimulus of activity does not act, becomes stunted. If a limb is placed in a plaster bandage it will become almost entirely immovable in half a year; if you fasten a muscle completely, the muscular substance disappears entirely, and so it is with all the organs. We are, therefore, dealing here with a relation which in good part is under the influence of our volition. Therefore, while our ancestors are answerable for whatever sum of life-material we have at the outset, and our conditions of nourishment in the widest sense are many times beyond our control, yet we can, to a certain degree, promote the development of our bodies as we wish by the excitation

of activity even in the most limited spheres of life. Indeed, it may be said, that an excitation of the bodily activity arranged according to the end to be gained, and carried out in this sense, may even do wonders in conditions of life which in and by themselves are defective. It is only in this way that we can explain how a great part of the poorer men who live under unfavorable conditions of income, and are by their circumstances, compelled to a vigorous bodily activity, very commonly surpass in health and in power of resistance to evils, the spoiled rich.

In this regard the nervous system acts like the other organs. Along with the original condition the influence of function is a very essential factor, and one of the greatest importance, particularly at the time of growth.

There are two extremes which finally produce the same result. Perfect inactivity of an organ leads to stunting, but excessive strain involves the same danger. Therefore, also lack of exercise of the brain in a determinate direction leads to the stunting of its capacity of performance. We have enough examples of this in practical life that certain individuals by a one-sided activity of the brain in a determinate direction can do extraordinary things in this direction, while by the neglect of exercise in other directions they are in many ways inferior to the normal man. One-sided demands made upon the activity of the brain must have an especially injurious effect when they take place at the time of the greatest brain development. Here is often certainly laid the foundation of a diseased weakness of the brain and nervous system. No connoisseur will deny that the characteristic of the disease of our time is weakness of nerves. And the question has already been asked from very many sides what are really the causes of this wide-spread weakness of the nervous system, which shows itself in the most diverse forms? Doubtless there are very different causes for this, but one factor lies quite certainly in the one-sidedness of the demands which are made upon the nervous system at the time of its development. If any one by preference make demands upon determinate parts of the brain, and exercise the nervous system very little in other directions, there easily arises from this one-sidedness of the strain a disturbance of equilibrium which does not prevent the brain from producing eminent results in certain directions, but which always involves the danger of disease. Now, it may be said, that the danger of a one-sided influence of mental strain is to be worked against by intervals of rest adapted to the purpose. It is indeed quite correct that every rational hygienic measure is founded upon the alternation of rest and work. We can,

by continuous muscular practice, cause our muscles to increase in volume and their capacity of work to be raised in a corresponding degree. This increase in mass and this access of capacity for work is caused by the muscles in their activity receiving more blood than in their rest. Now a removal of the detritus, which is produced by the activity and a restoration of new substance, is only possible when rest follows activity. By an uninterruptedly continuous contraction the muscle becomes at length exhausted and lamed. Now, just that which can be understood very easily about the muscles is true about the nervous system. In regard to this it is certainly true that every hygienic measure demands an alternation of work and rest. But the best kind of rest (in the waking hours) is that in which while the organ involved is recovering, there is not perfect rest all over, but activity in other directions. Evidently the nervous system recovers more favorably if we do not let absolute rest follow strained, one-sided nervous activity, but occupy ourselves in other ways. And when, therefore, any one who is obliged to exert the higher functions of his brain continually, and to do this in a sitting and quite improper position, wants to have the best kind of restorative to compensate for these evils, we can only advise him to substitute movement for sitting, and work in other directions, and especially work of the muscles and nerves, for the one-sided exertion of certain mental activities.

It may be said that in this regard gymnastics and athletics offer the best compensation for the one-sided exertion of the activity of study. I do not in the least deny that athletics have a great hygienic value, and that the school athletics of our generation have had an extraordinarily favorable effect in this direction; and that we would notice yet much more the injurious effects of the continually sitting method of life of our youth, if school gymnastics had not been taken up as an authorized subject of education. But athletics is not, from its nature, a means which suffices perfectly as a compensation in the sense spoken of. Athletics is concerned principally with energetic muscular activity. Apart from its influence in promoting muscular development itself, this acts upon the activity of the breathing, the movement of the heart, etc. As these means have a very beneficial effect upon the young body, a very valuable stimulation of all the functions of the body may be attained thereby. But athletics in and for itself, just because it is concerned with energetic muscular activity, is not a means which can be applied continually. It can not be our purpose to strive for the education of athletes. We see that just the highest increase of muscular practice brings

again the same dangers as from a deficient practice. It may be observed at this day that the disposition to disease of men with excessively practiced muscles, such as athletes and jugglers, is very much greater than in the average man. Plato calls attention to the same fact. I believe, in fact, that children from nine to fifteen years of age ought not to have more than four hours of real athletics in a week.

Instruction in manual dexterity stands midway between athletics, which excite a too energetic activity of the muscles, and instruction in study, with its one-sided activity of the central nervous organs. Instruction in manual dexterity includes gymnastics, and I believe that certain subjects which are practiced in instruction in manual dexterity are also beneficial in this sense. Joinery, for instance, contains a good proportion of valuable muscular practice; but it is necessary that in instruction in manual dexterity, as in athletics, as allsided an activity of the muscles as possible should be excited, and where that is not possible to the same degree, at least, in regard to the groups of muscles which are set in activity, a certain alternation of occupations should prevail. It is, indeed, not to be feared that in the conducting of instruction in manual dexterity those peculiar malformations will result which are produced by a one-sided position of the body, and with which we are acquainted in different handiworkers, as in locksmiths, shoemakers, smiths, etc., but these consequences of a one-sided strain will always induce us to take care that all one-sidedness be avoided.

Instruction in manual dexterity, however, acts in a much higher sense upon the nerves than upon the muscles, and this is very especially to be considered. It works upon the organs of sense, such as sight, muscular sense, taste, etc., which it brings into continually combined activity, and it works upon the peripheral regions of our nervous system. It might, therefore, be said that purely mental instruction in study exercises the central parts of our brain, the finest tools of our mind. Manual dexterity exercises the sense apparatus, the peripheral nerves as tools of the senses. Athletic gymnastics act essentially through the powerful excitation of muscular activity. According to this, instruction in manual dexterity is in a higher sense gymnastics of the nerves, and, just because it is a gymnastics of the nerves, it has an especially unburdening effect upon the brain, which has been strained by one-sided activity.

This consequence of the hygienic effect of instruction in manual dexterity is at any rate of the highest importance for the position of this subject in education.

What I have said may be summed up as follows:

(1.) Instruction in manual dexterity is a very praiseworthy means of cultivation of the senses as the tools of the mind. It completes that part of instruction by which the development of those parts of the brain which serve for the higher mental faculties are excited, while, by methodical exercise in the elaboration of the impressions of the senses, it reacts in favor of a harmonious cultivation of the mind.

(2.) Instruction in manual dexterity promotes sound bodily development when a suitable choice of work is made. It serves as a counterpoise to the influence of study-work, which is connected with mental strain and continuous sitting, while by the activity of the senses and nerves it has a diverting and unburdening effect; and, at the same time, excites the activity of the muscles as a lighter form of gymnastics, which certainly does not make athletics superfluous, but supplements them in a desirable way.

NOTE.—Among the hygenic benefits of manual training might be enumerated the joy of doing what is pleasant in constructing and fashioning the product of our own brain and hands.

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ILLUSTRATIONS.

Five Charts—Outlining of Wooden Forms.
Three Charts—Outlining for Object Drawing.
Five Charts—Colored Forms.

The gradual unfolding of a child's innate capacities as manifested in its unconscious play, developing into conscious play, and from unconscious labor into conscious labor, demonstrates the natural process of self-activity in human physical and mental growth, to be supplemented by conceiving intelligently and justly those legacies brought into the world from ancestry, and by furnishing experimental activities calculated to cultivate and to revitalize these inherited gifts.

The Kindergarten or Froebel system aims at this in principle and method, but lack of time prevents a full presentation of its educational advantages. Practical common sense begins to feel this, and a revision of Froebel's gifts and occupations, together with practical demonstrations by some of Froebel's disciples—as W. N. Hailman, City School Superintendent at La Porte, Indiana, and Col. Francis Parker, Principal of Cook County Normal School, Normalville, Illinois—leaves no doubt of the possibility of an organized connection between public schools and Kindergartens. The problem of human

development, in its philosophic unity, occupies therefore the thinkers of the age, and the question considering a desired school reform from a standpoint of social and national economy, is heard in Europe as well as here. It reads: "Shall the child continue without interruption its threefold development as begun in the Kindergarten?"

That is to say, by a self activity, developing gradually and systematically, when life's habits are formed by joyful creative occupations, which lead through work to work in its highest moral sense, and this at an age when the whole nature demands work; or

Shall we systematically pervert and destroy what has been accomplished in developing innate capacities by creative self-activity, according to Froebel's developing principles? Shall we not rather seek to connect the Kindergarten with the primary department, introducing creative, artistic labor methodically, thus becoming the leading nation?

Among the different manifestations in play, Froebel found the constructive and creative faculties best adapted to serve in general educational development.

They not only allow the widest scope for individual activity, but lead to a close relation to nature, its beauty, and life, and to mechanics and art.

But neither the skill of the hand nor the training of the intellect suffice to produce a complete human being. For this we need finer keys to disclose and reveal ourselves to ourselves—keys to open the lofty windows, into which streams of higher lights carry the message of an universal call.

A call which, aloof from wisdom and skill, appeals to the life of all life—to that which lies within ourselves—"the life of the soul"—which cannot be taught by words, but by living in its spirit. It is ingrained in the eternal sparks of our existence, born in each human being, and is either kept forever slumbering or is awakened and directed to life and action. It carries the seed-corn of strength, of character, of harmony, of religion, of inspiration and of love.

As keen as reason may seem in the young child, he thinks and judges by his sympathies. Unconscious as they are to the child, educational development has to turn them to consciousness.

Conception of order, harmony, and beauty, leading to ethics and principles are, therefore, embodied in the Kindergarten atmosphere, and who has never felt this irresistible power streaming from the "*littlest flock of the littlest people*," affecting the strongest men, the most indifferent women, the roughest parents, even the most corrupted inhabitants of whole streets?

It is the spirit of harmony, the spirit of trust, the self-restraining habit for the good and the happiness of all; the working in common, which cannot be practiced *too* much: the dealing with

the beautiful;—the poetry of nature, which Froebel's disciples claim must be continued. It is not what man *knows*, but what man *is*. Besides, daily proof declares that Froebel's system saves from one to two years in the curriculum of public school life.

The crowned success of Froebel's system in America and elsewhere gives proof of the unselfish enthusiasm, culture, and educational capacities in women; but in spite of it, Froebel's principles of "The Education of Man" are still kept in his offering hands. His spirit in full has yet to come. For this purpose the home and the school, man and woman, have to unite in work and aims.

From this standpoint the following may be kindly accepted and judged. It resulted from the earnest request of three enthusiastic workers for childhood's happiness and justice at Boston and Washington. Their request was—"give us the detailed and practical description *how* to use your form and color system. We need it."

WOODEN OUTLINING,

In its Possibilities of Intellectual Development.

The higher or lower grade of a clear perception is only proved by reproduction.

The young child lacks the use of descriptive words long after it has formed a clear perception of the thing itself.

Froebel used this fact educationally. In nourishing the child's constructive and creative faculties he not only diverted its destructive tendencies, but offered means to give expression and to prove impressions at a period when all further intercourse between the educator and child would fail, and neither its muscular nor visual powers suffice *for drawing*, of which outlining is but the coarser attempt. By outlining, the child develops early powers of attention and concentration of thought; perception of diversities in form, size, number; of an object as a whole and in its parts, and of those objects of which clear impressions are educationally wanted. It develops self education of the will through the hand, and *vice versa*, by trying to accomplish perfection in reproducing the true and the beautiful. Experiencing the usual expressions needed for clear understanding of facts and things, concerning position, direction, measurement, and number, it is led to perceive the relation between two things for comparison, the chief handle in Froebel's developing method. The use of this method, starting from the known to the unknown, offers ample means to direct reason and independent thoughts to a series of simple and graded facts, by wooden outlining, evolving faculties of judgment and clearness of conception of a superior order.

The net on drawing paper being almost abolished abroad, and in many places here, on account of injury to the eyes, some prominent

Kindergartners have likewise quitted the net on tables, to bring about a greater use of eye measurements. The assistance found in the circular measurements has therefore been greeted with enthusiasm. The use of forms illustrated in I, chart 1, proceeds strictly in gradually increasing diversities.

There is no surer means of gratifying the minor germ with a higher sympathy for life than by children's stories—the timber of the soul joining soul to soul by poetical waves, that carry, like a soft breeze, murmurs of childhood's simplicity in words and actions. They must present nothing strange, nothing artificial, but utmost delicacy in form and thoughts, fragments of beauty, of harmony and faith. Yet one must have all that in one's self. We may deceive man, but we cannot deceive the child. We are told that children are born lawless. Look at our reports of the most depraved ones in our Kindergartens. How soon does their assimilation with the silent growth of kindness and righteousness bear fruit and flowers of utmost delicacy! Is it that we have turned *their visions back to the black side of life from which they came?* Therefore, PRAY, picture but the good and live in the beautiful.

To accomplish this, the imaginative powers of the child should be connected with its reproductive faculties. The use of blocks and sticks, in spite of their great merits, *prove inadequate*, by placing the "CURVE,"—"*the line of beauty*,"—*out of reach of contemplation.* An effort has been made to overcome this by introducing a combined use of hemisphere, ellipsoids and rings, giving possibilities of producing copies of *objects* of life size, which, when supplemented by attractive coloring, furnish *the desired culture in the use and the combination of colors.*

Aside from this, opportunity is offered to counteract the one-sided use of straight lines and combinations of lifeless geometrical forms, to the neglect of the life-awakening and life-presenting forms, leading to the perception of nature in its charm and beauty. The young child measures each outer experience in relation to itself. It lives and judges in personifications, in the poetry and great brotherhood of all things; especially, of all *living* things. Its whole being strives for knowledge of nature. Actual responsible care of animals and plants should be called indispensable to a rounded moral and physical development of a human being. The experience the writer gained by laying out nine school gardens, situated from the Atlantic to the Pacific coast, to serve *educational* and botanical purposes, proved a great success for the youngest child as well as for the adult. Discussions for the establishment of school gardens, which took place last year at Boston, may therefore be greeted with hearty applause as one of the most beneficial progressive steps in education.

The following charts aim to direct the child's attention from the beginning to elements of natural sciences, offering a methodically

arranged series, which, starting with the circle, advance from the simple rounded fruit to vegetable forms, manufactured objects, and animals, used with circular sewing cards, modelling, and drawing in colors.

Wooden outlining, by the improved forms, furnishes the desired means to complete objects true to their size and appearance. It is a vast difference between fostering the child's imaginative faculties by material unadapted in its uncompleteness for reproduction, thereby *preventing it from ever reaching the truth*, or to *furnishing possibilities to find truth for the sake of learning to love and seek truth as such.*

The charts present but hints. The study of "Conscious Motherhood," of "Childhood's Poetry and Study in the Life Color and Form of Nature," in the "Connecting Link between the Kindergarten and Manual Training," and "A System of Child Culture" (the latter free of charge) are earnestly recommended.

NOTE.—Send for copies to D. C. Heath Publishing House, Boston, Mass.; John S. Lockwood, 47 Franklin street, Boston, Mass., and Emma Marwedel, San Francisco, Cal., or Washington, D. C., 513 12th street, care of W. Burchard, Esq.; George Philip & Son., Publishing House, 32 Fleet street, London, England; George Winkelmann's Sortiments, Buchhandlung, 2 Spittelmarkt, Berlin, Germany.

I. Chart 1.—Outlining in Wooden Hemispheres.

The Curve as Comparative Measurement.

Adaptation to Conception.—The hemisphere contrasting the sphere; the sphere contrasting the circle; the circle, as standard measurement, contrasting the forms presented on chart. Similarities and dissimilarities presented. Their relation to each other.

Direction for Use.—Have sphere modeled same size of hemisphere; cut in halves by wire; compare before and after cutting. Draw no objects on blackboard to be copied except for comparison. Guide to reason and cause and effect. Provide real objects. Analyze their outlines. See Conscious Motherhood; "the nursery"; the sand-table; the solid balls; paper circles. Illustrate change of form by soft rubber balls. Offer at first to all children equal number of hemispheres for making circles. Change for more or less numbers to effect differences in sizes of circumferences. Draw circles around each figure presented on charts; observe existing deviation between circle and figures.

Figure 1—Circle.—Bring the circle to conception of the children; compare with solid rubber balls.

Methodical Making of the Circle.—Use forms giving views of the circle—as bottles, lids, rings of different sizes. In making the circles the child may at first use the described manner; then compasses, and later, eye-measurement.

1. Finding the center of a piece of paper or the center of a figure.
2. Marking the center with a dot.
3. Placing a ring or circular form on the paper, center to center.
4. Tracing the circular form with pencil to be done with the left hand, as well as the right. All these exercises practiced on slates and blackboard.

Figure 2—Orange.—Press rubber ball top and bottom; observe change of form. Compare circle and the grown orange. Taste, smell and touch it. Cut open. Observe inner construction—flesh, juice, seeds, pores, oil and color of skin. If possible, show flowers, branches and leaves, and different stages of ripeness of fruit.

Describe beauty of orange groves. Tell stories and teach simple rhymes. (See "Conscious Motherhood.") Have orange modeled life size, and colored. Use sewing cards simultaneously with outlining. Introduce peach, to observe difference in form, showing but one indentation, and inner construction as stone fruit.

Figure 7—Apple.—Make two indentations on rubber ball.

Show change of form. Compare carefully inner and outer construction of orange, peach and apple as suggested.

Figure 5—The Grape; 6, the Plum; and 8, the Pear.—Compare these with stone fruit, with fruit of kernels. Present different specimens of fruit. Compare and deal with them in prescribed manner. Bring specimen of each kind. Boil, and compare difference with dried, canned and sugared fruit. When able, let the child draw the outlines. Point to the beauty and taste of fruits; speak of the delight it gives, and God the Creator.

Figure 3—The Egg.—Compare the circle with the egg-shape in form and appearance.

Compare the egg with the plum. Point first to similarities, then dissimilarities in form, color, size, weight, as general qualities belonging to all objects, followed by similarities and dissimilarities of special qualities. Break the egg. Have told what is known. Do not tell; do not meet the child with your *own* explanation. Wait till next day for child's answer. Give ample time for self information, the best teaching you can give, even if the investigation of the egg should take a week.

Identify the egg, as a centre of life and growth, with the germ of the plant. Speak of baby seed in the flower as well as in the egg; that their little brother was but another yet more beautiful *baby seed*. Impress the difference between life and dead matter—human life, its love and obligation. (See Con. Moth.) Observe germination by putting seeds on blotting paper, between cotton, two panes of glass, in boxes of sand and sand table. Make the care of the growing plants in sand table a reward, as in San Francisco Free Kindergartens. Furnish each child with a flower-pot to take care of. Guide to a religious poetical conception of plant life, as this brings

higher moral value to the child than all learned dissertations in after years. Refer to the striving for perfection in plant life, to serve and to give. If possible, have some birds or a hen hatching its eggs. Observe the whole process of incubation *reverently*. Point to the self-negation shown in the mother bird's care.

Figure 4, the potato; 9, the tomato; 10, the corn.—Compare as usual. Point to the short yet useful life of vegetables. Plant potato; observe germination. Model the objects from life, color, and, if possible, draw them. (Sew sewing cards.) Be careful in choice of natural colors for objects.

I. Chart 2.—Outlining in Ellipsoids.

Illustrating similarities and dissimilarities of form, color, size, number, position and direction.

Adaptation of Conception.—Comparative differences observed in form, color, size, number, and names of things give a knowledge of facts, without which no perception of one object nor any comparitive judgment between two things can take place.

Direction for use.—Begin with what the child knows, and add gradually and carefully what he may know and should know. Never tell, but *slowly deduct*.

Figure 1. Find out what knowledge the child has of form, color, size, number, position, and direction, and distance measurement. Give names if necessary, but preference to the crudest individual description of the child. Have the forms discussed, of what they were made, by whom, and for whom.

Figure 2. Describe what is seen in form, color, position, direction, number. Separate and change figures—increase and decrease of size and appearance. Compare with previous figure. Describe difference of size.

Figure 3. Describe what is seen, etc., and compare in the same manner figures 4, 5, 6, 7, and 8, offering the same exercises in variety of appearance and increase of number of ellipsoids.

Be exact, not allowing the child more ellipsoids than are successively presented in exercise. Encourage two or three children to combine for work in common. Be liberal in changing colors to taste. It is a grave educational fault to over-feed the child with quanities of educational means instead of giving experience of its own resources by doing great things with small means.

As soon as possible let one child give dictation to the class. Let the children agree among themselves about terms they wish to use for the points of connections on ellipsoids and rings. The observation of an almost yearly change of these terms, especially in the

dictation for forms of the fourth and fifth gift, affords much psychological interest; not less the exactness with which these terms were kept, and the sharp criticism directed to clear, precise language among small children—a point greatly undervalued in pedagogy, yet fundamental to each branch of learning, for construction and expression of thoughts. Dictation of *one child to three others*, in blocks, sticks, tablets, and rings, starting from the centre, extended by the four corners, with their intermediates, serving as a weekly exercise in common, frightened not seldom the untrained normal scholar, in spite of high school, college, and even university learning—their rivals being children from nine to ten-and-a-half years of age.

Figure 9.—Observe new elements. Describe what is seen in form, color, size, etc. Point to similarities and dissimilarities between figures 8 and 9. Ask the child of what the figures remind it. Request the child to bring flowers next day whose petals grow similar to positions of ellipsoids in figures 8, 9, 10, 11, 12, 13. Compare colors of petals with those of ellipsoids. Expect plainest, individual, but distinct language in describing. Analyze each figure. Figures 14 and 15 suggest free use of combining hemispheres and ellipsoids. The sewing cards furnish patterns for flowers and leaves. Let the child combine them with stems imitated by hemispheres. Have the whole drawn, and if well done have it colored.

I. Chart 3.—Outlining in Ellipsoids of Objects in Life Size.

Adaptation to Conception.—Observing the young child's tendency to content itself with small things, we experience not less the difficulty to provide it with a clear perception of comparative measurement between small and large objects, sufficiently observed by having described real objects or pictures.—(Prof. Stanley Hall and City Supt. Greenwood.)

Notwithstanding the moral obligation to satisfy the child's natural craving for wanting and knowing the truth and to supplement its imaginative faculties, the practical need of teaching right seeing is of no less weight.

The chart presents, therefore, by means of outlines, some objects familiar to each child, which, though they may differ in form and size, suggest the normal appearance of known things. Their appearance more or less corresponding with the real thing remembered by the child, opens, when described, discussed, or on trial for reproduction, an unsurpassed opportunity for a lasting conception by experimental activities, so much more valuable at a period when a reproduction of pencil lines would be impossible.

Direction for Use.—Discuss form, size and use of the object. Analyze its outlines, its relation to home-pleasure and comfort, and the material it is made of. Let the child describe the form and color and size of the same objects used at home. By this they will

become observant of all they see at home. Show, if possible, coffee, tea, chocolate and sugar in their raw state and prepared for use. Speak of milk in its great usefulness and benefaction to man. Point to the dependence of man on animal and plant life.

Man's Obligation to Care for Animal and Plant.—This opens a wide field to satisfy a child's inquisitive sympathies with its environments, which will last for ever. If these forms are too difficult to copy, take a simple mug, a simple cup, to begin with. Draw them in lines on the blackboard, to be copied in wooden outlines, or cut these forms in paper, letting the children place the ellipsoids around the edges. Let the children propose what they desire to copy. Dictation of one half the figure may be given, while the other half is copied to complete the whole. Have the figures drawn and colored by the teacher on the black-board.

I. Chart 4: Outlining of Objects to be Enlarged in Size.

Adaption to Conception.—It has been heretofore an educational aim to observe and *compare* measurement between one or more objects, while it is the object of this chart to lead to *enlargement* of size. The objects, simple in outlines and construction, are familiar to the child and allow any reasonable degree of enlargement. The exercises consist in finding equal extension in height and width of the objects to be enlarged. If the child proves practical capacity, and a clear understanding of how to reconstruct the forms presented, its sense of forms has greatly increased.

Compare objects on chart in the described manner. Discuss shape, use and material of the objects presented. The ideas of the exercise as intended, demanding independence of action, delight each child.

Direction for Use.—Disturb the child as little as possible in its individual conclusions to reach the goal. The power to solve cause and effect by reason, pays highest in the market of life, and marks "the self-made man and woman." Actual labor, to overcome difficulties, strengthens this power; it forms characters by force of will, to which the power of brain stands but subsidiary. For this reason we want labor in our primary schools as we use it in Kindergartens.

I. Chart 5.—Outlining in Ellipsoids, Presenting the Line of Beauty.

Adaptation to Conception.—We know of the existence of Academies of Pottery among the Greek and Romans, proving that the harmony of proportion admired in the work of the ancients resulted from submission to the studies of laws of harmony.

Our time has still to obey these underlying laws of beauty and harmony. Unable to surpass their perfection, we use their models

as types of a noble grandeur and simplicity in outlines, with delicate touches of a true conception of the idea of things, showing a spontaneous individual originality as outgrowth of a poetic and symbolic conception of nature and its beauty in plant-life. Unfortunately, our age has given way to a submission to changing fashions and their tyranny. A number of superfluous decorations are used to hide the lack of simplicity and beauty in outlines. To counteract this condition, especially at the first period of childhood, is an important educational obligation.

My own experience of the educational effect of familiarizing children quite young with the ideas of the beautiful, has been surprising. The "Bilder Atlas," a companion to Brockhaus' Encyclopædia, illustrating the history of culture and art, impressed children, again and again, with renewed interest and joy, leading to the request for books to satisfy their interest more extensively, while a series of the "Münchner Bilder-bogen" (the Munich Picture Sheets), illustrating the history of culture in Egypt, Greece, and Rome, were chosen on rainy days to fill the recess hours with the sunlight of intelligence and broader conception.

The successive collecting, the cutting out, the arranging, and classification of objects uniting the pupils, the students of the normal class, and the teachers in labor in common, produced a wonderful educational effect.*

Direction for Use.—Proceed in the described manner, compare one form with another, refer to use, material and the value we attach to the models and their origin. Let children describe their vases at home. Let each child give reason, if it can, why it prefers one shape for another. If there is a collection at hand, show specimen of art from the most primitive to the artistic.

I. Charts 6, 7 and 8. Outlining of Three Birds.

Adaptation to Conception.—In the same degree as drawing becomes recognized in its educational value by furnishing means to analyze in lines, recrystalizing and reproducing previously received impressions, the opinion grows that these exercises should accompany our *first* teachings. For this purpose Froebel proposed outline-drawing by wooden sticks. If charts 6, 7 and 8 brought outlines of a snake or a fish, it would have seemed more practical; but having a methodically arranged series in view, the birds were chosen only

* The *playroom* walls at San Francisco being without plastering, were covered by cotton muslin, imitating brown arches, with inlaid panels of scarlet muslin, six by two and a half feet. These panels contained a series of artistically arranged illustrations, consisting of thoughtfully collected and cut-out pictures from periodicals. They presented on these panels the stone period, architecture of Egypt, of Greece, of Roman and of modern times. Also the living of human races, and presentations of the beautiful and numerous scenes of animal and human life, etc.

because they present birds' *life*. The existence of birds, their rich and wonderful practical plumage, their swift flight, their nests as homes, their frugal habits, their artistic skill, their hatching their lovely songs, make them refined friends of man, especially of children, and no teacher will fail to enlighten and elevate the latter with an endless variety of bird stories.

They were chosen in reference to the striking difference in their way of living; so striking that the mere feather, bill, or claw of a bird tells a child, by reason, how he lives and where he lives, leading it, unknowingly, to classification. There are no creatures offering better exercises for comparative observation (Froebel's chief factor of development by self-activity) and reasoning than insects and birds, the latter preferable at the beginning.

The feathers, bills, and claws collected by the children for our cabinet were the open books, and, we read many others of similar kinds, which could be read with delight at any free hour, *with or* WITHOUT teacher, long before they had to overcome the stumbling-blocks of "spelling hard words." They read about them in the birds' own hieroglyphic language with the very first freshness of childhood, at a period of life when their sympathy for things they love is greater and fuller than it ever will be afterwards. Not by intellectual, but by emotional forces, is the ethical power of human developments.

Cabinets.—That is a collection of things brought together by the interests of the children and their friends, and should be in every Kindergarten and school room. A shelf with some pigeon holes, bought second-hand, can be painted by the older children with delight. We made our arbors, painted them—did the garden work, the watering, and Friday gave the pleasure of a general weeding and cleaning-up day in our large vegetable and flower garden and cozy palm grove; furnishing work in play and play in work. Every gift to the cabinet was labeled and placed by the children. Seeds filled in bottles (they crossed the plains from Washington, D. C., to San Francisco), wood polished and unpolished—stones, shells, beetles—butterflies and cocoons raised by the children; all kinds of furs, of samples of cotton, linen, woollen, and silk goods were kept. They served to illustrate or explain at any moment what seems desirable to be observed. Certain days offered the privilege to appointed children to select any object of which they desired information. This spontaneous answering to which the child loves to know, Dr. E. Seguin calls "*the only way* to furnish lasting instruction." Self-instruction is much undervalued. This expressed itself in rather a *cute* manner among my pupils, ranging from six years and upwards: self-instruction demanded a magnifying glass, each child one for itself. For this reason they made it a desired gift among their birthday presents.

Plants fresh from the children's garden brought in each Monday morning furnished oral, written, and drawn explanations of "what I saw." Here the children of the Kindergarten and Primary Classes relied in earnest on their microscopical investigation, "*to be sure I saw rightly*," thus developing character by self-reliance, steadiness, exactness, reverence, seeking for and living in truth.

Direction for Use.—Analyze outlines. Compare the characteristics of the three birds by general appearance and shape of limbs. Have them copied by wooden forms.

Instruction in natural history without object drawing is no longer permitted at any stage of development. Outlining as presented is the beginning of it.

The possibility of drawing and coloring botanical objects has been demonstrated for years at my Kindergarten and school at San Francisco.

MATERIAL.

1. Hemispheres in one Size.—Three-fourths an inch diameter, in six primary and secondary colors: in wood color, black, brown, and gray.

2. Ellipsoids in two Sizes.—One and one-sixteenth inch in length, of similar colors to hemispheres.

3. Whole rings in three Sizes.—One and three-eighths inch in diameter, one inch in diameter, three-fourths inch in diameter, in twenty-four colors, in two shades of primary, secondary and tertiary colors—black and wood color.

4. Half rings in three Sizes in same colors.

5. The Superior Conte Pencils in twenty-four colors, corresponding with the colors of the rings.

6. Five illustrations on charts 12 by 18, of outlining life-sized objects and directions.

Three similar charts, presenting outlines of objects of natural science and directions.

Five colored charts, furnishing gradual exercises for original combinations in form and colors.

The charts illustrate visibly and descriptively each advance step, sufficient to enable a most inexperienced teacher to use them in giving lessons in *outlining*, *drawing*, and *coloring*.

The Conté's pencils, used for years in my own establishment, furnish the finest colors in the world. They produce faultless combination in delicate tints and shades.* They consume less lead,

* A well-known manufacturer of pencils would not recognize a drawing as done by pencil.

NOTE.—I drew some years ago, at Washington, two Greek patterns on the blackboard. They were compared, and at the close of the inventive drawing lesson almost all of the forty children, ranging from five and a half to thirteen years, had invented one or two charming patterns a la greque, still in my possession as relics, proving the natural artistic creative capacities of childhood.

I remember a boy, Charlie, nine years old, of San Francisco, who, not quite well, had to leave the drawing lesson on Friday. He asked for his drawing-book to do some little work at home. Monday morning, returning his new book, it was filled to the last page with a variety of most charming designs, each in turn worthy of practical use. He was a high-born pattern designer, but he said he had to become a clerk in a bank.

and excel in **not breaking** if cut carefully. *They are of equal expense with other pencils*, while the educational advantage of working with the more delicate pencil lines instead of dabbling with water colors at such an early age is apt to be overlooked. In short, they solve in an unsurpassed *degree* the *possibility* of a general *introduction*, admitting the justified objection of our teachers in public schools, against the *water colors*. Give our highly gifted, enthusiastic childhood the chances. The results will surprise the age.

CONCLUSION.

Childhood's Joy—Man's Civilizer.

No epoch of culture can be judged without reference to its understanding of form and color. The clear perception of simple grandeur among the Greeks, the artistically original creation of their mythological statues, and the harmonious perfection of their bodies, show an insight into the relations of form which causes astonishment to our cold, mathematically-artistic, imitative age. Still, we must admit that the sense of form is to be regarded as one of man's strongest natural gifts.

Form is the first language which becomes intelligible to the child; it is the most impressive, the most indellible, because it falls on the yet unwritten page of his soul, as the first means of development which leads him from the unconscious to the conscious state.

In most cases a simple ring, a point in which the child dreams over again the chief events of days and hours, is sufficient for the child's observant eye. In spite of these hints of all means of education, nothing has been left more to chance than an early comparative understanding of form and color; and with this an early feeling, seeing, and understanding of the beautiful and orderly in our surroundings and in nature. Therefore few are capable of using form as an expression of ideas, a thing in which the ancients and primitive nations were and are so far in advance of us. Why should this be? Because there is a notion that an understanding of form is a special power, not a general, one and as an individual gift seldom found. Yet this view is decidedly contradicted by natural art industries among the Swiss, the folk of the Tyrol, and of Thuringia, and Bohemia, as well as many primitive nations.

The simpler and more intense is an expression, and the oftener its repetition takes place in animating change, the more permanent are the healthily educational effects on the child.

The outlines of the simplest forms of Nature which surround the child are therefore earliest comprehended by him, and first awake the wish of imitation. The child sees in the ball the round apple and at the same time tries to recognize the difference between them

because he is fond of them both. Educational guidance has to avail itself of this.

Professor Virchow recently stated before the Anthropological Society in Berlin, that he was obliged to recommend his young students color studies at the beginning of each fresh term, as he found them incapable of distinguishing red, blue, or brown, in black; or yellow, white, or green, in grey. So important did this shortcoming appear to him for the totality of human culture, that he petitioned the Reichstag as to how this could be avoided. The state of affairs seems still more grave when celebrated oculists inform us that in schools, especially elementary ones, the perceptive understanding of mixture, shades, and grades of colors is paid no attention to; which is the more to be pitied, as Tyndall, in a prophetic anticipation of the future of a higher developed sense of color, points to the existence of a wealth of colors as yet undreamt of. Canon Farrar, of Westminster Abbey, says, in a lecture before the London Society of Arts: "Each neglect of art as a means of education must carry with it great drawbacks. We give early instruction in reading, writing and arithmetic, but the far more important development of feeling and understanding for all that is beautiful is shown to be completely neglected. The same child, who can tell you how many pounds of meat he can get for a shilling, has probably never inhaled the odor of a rose with exalted feelings. Let us, then, before all, begin with the culture of the senses in our homes and schools."

And now, as to the child himself. Observe his nature, his activity. Science maintains that the strength of the senses of the child till his eighth year is greater than that of an adult, and later on diminishes. This becomes manifest when we consider what he acquires, without our teaching, by the activity of his senses within the first four years, two of which are passed without the means of speech. The child wants to know, wants to learn, but not by passively receiving.

He himself wishes to see, hear, taste, feel, and smell; he, so to speak, dictates the course of his own teaching. Free conclusions of reasons lead the child to free investigations about the what, how, why, and when. The great principles of alternating influences, of continual permutation of matter, the incorporation of that which was, is, and will be, does not enter his young fresh child's soul as science, but as a perception of his senses leading to reason. This is the time when the beauty, the harmony, and the laws of life must enter, like fertilizing sunbeams, in the emotional life of the child. The child knows it; he wishes to strive with his own powers for this self-education. He instinctively reaches for form and color.

This constantly reaching after the use of forms in its individual and national value has impressed the mind of many prominent leaders of education.

Wishing to assist in this just demand, I experimented at its solution for years by reason and by means of objects. Each proceeding carried the weight of practical experience, gained from the small child, to the adult. What appears is but the statement of happy results achieved—the *incorporation of children's* **Joy!**

II. Chart 1.—Form and Color.

Child's earliest training in color sense.

The child having been playingly impressed with the existence of colors and their modifications by the mother (see Baby's Delight, in Conscious Motherhood) may also be playingly familiarized in the Kindergarten by a glass prism—telling the fact that color is an effect of light. (See E. Marwedel's Botany, "The Twin Sisters," "Air and Light.") This should be followed by observing the spectrum (from all sides), and being led to observe repeatedly the rainbow in its metamorphic change of glowing and subdued colors; the beautiful interchanging flow of tints and shades in a sunset; the moon with her purified silvery rays, lightening the dark side of the world, speaking in her grotesque individual language by her long-stretched shadows, a miracle to each young child. The shades falling on the waves of the water, falling on the hills and valleys, on the foliage of trees and fields at different times of the day and the seasons should touch its poetical nature with the great rhythm of harmony, impressing it for ever and ever with the intensity of all things, and this at an age when discord and separatism have not yet destroyed the idea of the great brotherhood of all that exists.

Not less should our own school rooms be educational. The rosy tint—the effect of sunlight—of some red curtains falling on the walls of my kindergarten served the purpose; so any other effect of light and color in nature and in pictures. The school garden with its flower beds, the choice of flowers for bouquets, picked fresh from the *own* garden for mother and loving friends; the filling of vases with flowers for the school rooms were performed æsthetically and discriminatingly. Even rainy days had to demonstrate that the gray color effects soothingly the poetical home comfort.

These influences direct the child to *see*, and to *live* in color effects, and to *seek for them*.

"Why," asked a mother, "does my little girl (five-and-one-half years old) so often look up to the clouds, enjoying their coloring, and want me to have the same pleasures?"

"Watching the colors" was the term among the five and six year old æsthetics. There was no teaching, but undeniably a self-education in the conception of the beautiful, fostered by exercise and the knowledge and sympathy on the part of the teacher. The usual curriculum in the kindergarten begins by introducing, first the,

primary, then secondary colors in connection with the work. I never yielded to this, conceiving the impossibility of exciting in this manner the refinement of color sense, very desirous, however, to restrict the number of color impressions to three, I use the primary colors in their tints and shades.

Yellow, less glaring than red, was first used. Yellow was shaded almost to brown, the red to cardinal. The series of linear combinations in sewing, including the *square divided* diagonally, was executed in yellow.

Blue in its scale from light to dark served the second series, the oblong divided diagonally; while red, shaded into cardinal, was used for illustrating individual combinations of principles—called applications. This was also practiced by my Training Class.

This considered four points: 1st, the power of seeing each color by itself; 2d, comparatively to each other; 3d, comprehensively as a unity of colors leading to combinations less crude in conception and execution, allowances being made to break the glaring effect of contrasts in every direction. Different tints of one color presented to the child on pieces of stiff paper, often in eight tones, were not seldom more quickly and better distinguished by the children than by the students. However, the highest scientific understanding of color, "as color," and scientifically approved relation of each to another affects no higher qualities in human development; without the spiritual relation of the laws of the beautiful from within—that is by the individual culture of the emotions capable of ameliorating the idea and the higher nature of things—color knowledge remains but a professional training.

The danger involved must not be overlooked. Criticism is sharp and restless—negative. The American Nation is a critical one. Plasticity wants rest, wants peace, and *affirmation*, for creative powers.

From the mere scale of order to symmetry, from symmetry to the rhythm of harmony, to an elevated conception of art and its creative forces, is a long distance.

With perception as its guide the man in the child depends on its own self-activity. To the Nation falls the obligation to nourish and strengthen the capacities necessary to reach the goal if possible; not for the sake of an artist, but for the creation of happy cultured beings in the scale of a progressive humanity able to comprehend the law in beauty and beauty in law, the created in the creator.

For years I have tried to introduce by means of instruction in drawing and coloring, a certain grade of general culture, without which no clear conception of man himself, or of his environments, is possible. Botany in its general attractiveness and moral spirit in developing human *constructive* instead of *destructive* faculties seemed to be best adapted.

A botany written for this two-fold purpose cultivates the poetry of plant-life without destroying scientific truth, fulfilling the mission of bringing the child in daily contact with the beauty of nature by drawing and coloring the objects placed under investigation, opening the widest field for the studies of the harmony revealed in the tints and shades and hues of nature.

The colored forms used in outlining are, therefore, changed to colored rings and half rings of different sizes, enabling the child to combine them in pleasing forms and colors at an age when no other material can be used for the same purpose.

Some colored charts give direction, but may be obtained as uncolored lithographs.

Charts for practice in mind pictures, identical with form and color figures to recognize arithmetical diversities, can be obtained with the ellipsoids free of charge.

Send for circular "A System of Child's Culture," by Emma Marwedel, free of charge, from D. C. Heath Publishing House, Boston, Mass. Mrs. Grant, agent of Miss Marwedel, at Chicago, Ill., 2312 Indiana avenue.

PRICE-LIST.

Balls..	per 100	$4 00
Investigations. Printed matter.		
Sewing Cards	" 100	1 00
" "	" 500	4 00
Will be improved by names. Printed matter.		
Uncolored Ellipsoids, two sizes	per 1000	2 50
" " " "	" 500	1 50
Colored " " "	" 1000	3 75
" " " "	" 500	2 00
Uncolored Hemispheres, two sizes	" 1000	2 50
Printed Matter.		
Uncolored Hemispheres, two sizes	" 500	1 50
Colored " " "	" 1000	3 75
" " " "	" 500	2 00
Uncolored Rings, three sizes	" 1000	2 50
" " "	" 500	1 50
Colored " " "	" 1000	3 75
" " " "	" 500	2 00
Uncolored Guide Book		50
Conscious Motherhood		2 00
Childhood Poetry and Studies.		25
Conté Pencils (assorted colors) per doz		1 00
" " " " " half doz		60
Forms of stiff paper to be cut with knife.		
Plates I, II, III, (1 doz. samples each)		75
or Fms in wood 25 or 50 samples.		

Extracts from Letters received by Miss Marwedel, with permission to publish.

I am pleased with Miss Marwedel's development of elementary drawing for kindergarten and primary work. It is philosophically correct, and delightfully practical. Altogether, her modified plan of work seems to me to be a real and solid advance and improvement. The abstract of the work on Motherhood indicates a manual of great value.

JOHN SWETT,
Prin. Girls' High and Normal School, San Francisco.

May 10, 1882.

NORMAL PARK, ILL., *Aug.* 2, 1884.

MY DEAR MISS MARWEDEL:

Your plan of kindergarten work, so far as I can see, is entirely philosophical. It is true to child nature, and adapted to its wants. We need very much a plan of development into science, drawing, form, and color, that will take the child from the kindergarten up through the primary schools. When I can get the steps of your plan, so they can be used, I shall try it in primary schools with great confidence.

Yours very truly,

FRANCIS W. PARKER.

NORMAL PARK, ILL., *Aug.* 5, 1884.

TO WHOM IT MAY CONCERN:

Aside from being much pleased with the general interest which Miss Emma Marwedel induced in us for the kindergarten during her short stay at Normal Park, we were taken with the novelty and reasonableness of the system of drawing presented by her, which finds its primary elements in the circle rather than in the right line, as is the case with common systems. Nature is rich in curves and poor in straight lines; we hopefully await the future of that educational drawing which seeks perfection of sense concepts rather than the artistic as its end. Surely the system as outlined for us by San Francisco's great kindergartener tended in this line, and we wish it God-speed in its developments.

HENRY D. HATCH,
Prin. School No. 2, Moline, Ill.
W. W. SPEER,
Teacher of Mathematics in the Cook County Normal School.
(Taking kindergarten work at Summer Institute, Normal Park, Ill.)

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28 MAIN STREET,
HARTFORD, CONN., *June* 17, 1885.

DEAR MISS MARWEDEL:

. . . I sympathize with you heartily in the importance you attach to the mother element in child culture; properly educated herself, the mother's nursery and home would be the true kindergarten for the infant and young child; but as mothers and homes are, we must look to well-trained kindergarteners to perform that function properly. . . . Yours truly,

HENRY BARNARD.

July 19, 1882

Miss EMMA MARWEDEL.

DEAR MADAM: I thank you for your patient explanation of the details of your plan to substitute lessons on the globe and the circle for the straight line figures, that Froebel introduced in the first lessons of the kindergarten course.

While I am not prepared to say that I see the truth of your position beyond all possibility of change of opinion, yet I am now inclined to think that you have brought forward a genuine improvement to the old plan of teaching the drawing lessons in the kindergarten. It seems as if Froebel would have taken your course, if he had seen how to make the minutely graded steps that you have made in giving the use of curved lines to the pupil at so early a stage. No doubt your plan will interest the pupil more, and will give him better powers of seeing unity of form in nature, and hence develop the artistic talent more securely.

Respectfully,

W. T. HARRIS.

BERKELEY, CAL.

Miss EMMA MARWEDEL, San Francisco.

DEAR MADAM; I am much pleased to see, from the prospectus just received, that your work, connecting by an easy, interesting, and logical method of progression the kindergarten instruction as established by Froebel, with the "study of the life and forms of nature," is soon to be before the public. I cannot too strongly express my sense of the importance of accomplishing what is directly contemplated by your expansion of Froebel's system, namely, the early training of the child to habits of accurate perception and observation of nature. The great majority of men and women pass through the world as those who, although having eyes, see not; and it is with difficulty that the graduates of our grammar schools, and even of our high schools, strive to make up, in later life, for the omission to provide for the training of their perceptions, that is so flagrant a gap in our educational system and diverts so many lives from their proper aims. The effect of kindergarten training, as usually understood, upon success in the later study of the sciences is most striking; but there is no reason why this advantage should not be more fully realized by a direct introduction of the forms of nature into kindergarten training; and this is admirably carried out in your work in the direct and comparative juxtaposition of the geometrical circle with such forms, showing their mutual relations. But apart even from the kindergarten proper, the idea is a fruitful one for use in the ordinary schools of drawing as well; and the whole cannot fail to suggest to teacher as well as pupils a different and much higher plane than that on which such exercises are commonly conducted. I earnestly hope that your work, and the principles it sets forth, may find the widest acceptance among the educators of the young.

Sincerely yours, E. W. HILGARD.

STATE OF MARYLAND, EDUCATION DEPARTMENT,
BALTIMORE, MD.

Miss Marwedel has explained to me her system of child training from the cradle upwards. I have great confidence in her methods, and await with some impatience the publication of the book which she has in preparation on the subject. I feel assured it will make an impression, and lead to good results.

M. A. NEWELL.
Superintendent, etc.

I have read the manuscript with great pleasure, and should be delighted to see it published. Your circular system leads the child at once to life, beauty and nature instead of dead matter.

LOUISA P. HOPKINS,
Supervisor of Schools, Boston.

PHILADELPHIA, PA.

No woman in the country is more competent to write on earliest education and the kindergarten than Miss Marwedel. I have examined her work and believe its publication will be serviceable in promoting a better knowledge of Froebel's philosophy and methods.

JAS. MACALISTER,
Supt. Public Schools, Philadelphia.

4815 KENWOOD AVENUE,
CHICAGO, *Oct.* 6th.

MY DEAR MISS MARWEDEL:

I think it must be a great satisfaction to you to realize that while so many folks are groping about for the proper expression of Froebel's theoretical idea, you are able to take so many elements of beauty into a child's life and by your material bring the true art principle down within the *baby's* hand and heart. I wish we might all learn from you of the true feeling of beauty which must come before the *knowledge* of it and that we might all if we *would*, lead this sub-conscious stage of growth into a far higher realm than we have ever attempted to reach.

With love,
ALICE H. PUTNAM.

MRS. ALICE H. PUTNAM being the first to order the ellipsoids writes as follows: "I hope to hear that your material is largely used, for I believe it is adequate. Especially do I feel so about the cutting in wood which comes to me to fill an 'aching void' left by the production of Sloyd that only speaks of use in its utilitarian sense and so far as I have been able to see, totally ignores beauty, or anything approaching beauty, except perhaps strength. Better days will come for my grand children!"

And further on——

"It made the tears come, to read the manuscript you sent me on color and to realize that while nature is so free in her gifts of color, so true in her method of developing this sense we have been so *blind* and *stingy* and so wrong in our use of it. I shall be glad to have all of your thoughts in this big question in black and white. You have said much of it in your 'Conscious Motherhood' that is available, and I have used the book in my classes."

WASHINGTON, D. C., *Oct.* 28, 1890.

MY DEAR MISS MARWEDEL:

I wish I had both time and ability to write volumes, for I feel that too much cannot be said in favor of your ingenious works of art for children. Those beautiful drawings and harmonious blending of colors which you showed me it was possible to produce have been a great delight as well as a great help to me. I have used your colored charts with very satisfactory results and hope to accomplish much

more with the rings and ellipsoids. From the slight experience I have had in using your gifts I am confident that nothing but good results will follow. I feel sure that your method of the curved lines will open a wide field of development for the young. Yours very sincerely,

LOUISA MANN,

CHICAGO, *Oct.* 7, 1890.

I take pleasure in recommending Miss Emma Marwedel's color forms. I have used them and find them exceedingly interesting and instructive.

EVA B. WHITMORE.
General Superintendant of Chicago Free Kindergarten Association.

I most heartily recommend the use of Miss Marwedel's color forms. The colors harmonize well and are restful to the eyes. The forms also are most satisfactory, as experience has proved.

MRS. MARY McC. B. PAGE,
Principal of Chicago Free Kindergarten Training Class.

Among the testimonies to Conscious Motherhood, accept that of Mrs. Alice H. Putnam and of "Books" in "Parent's Review," London, England, published by W. H. Allen & Co., 13 Waterloo Place. Edited by Charlotte M. Mason. "The book has been very well received by the American press and deserves the praise bestowed on it, but for all of its 500 pages it is too short or rather too sketchy. It is of course one long address by one who understands children but twenty volumes would hardly be enough to lay Miss Marwedel's subjects fully open. The author shows the fullest appreciation of the importance of the subject. The whole book is a logical but original development of Froebel and we are sure the author would claim that it leads children to the maximum effect with the minimum waste of time and temper.

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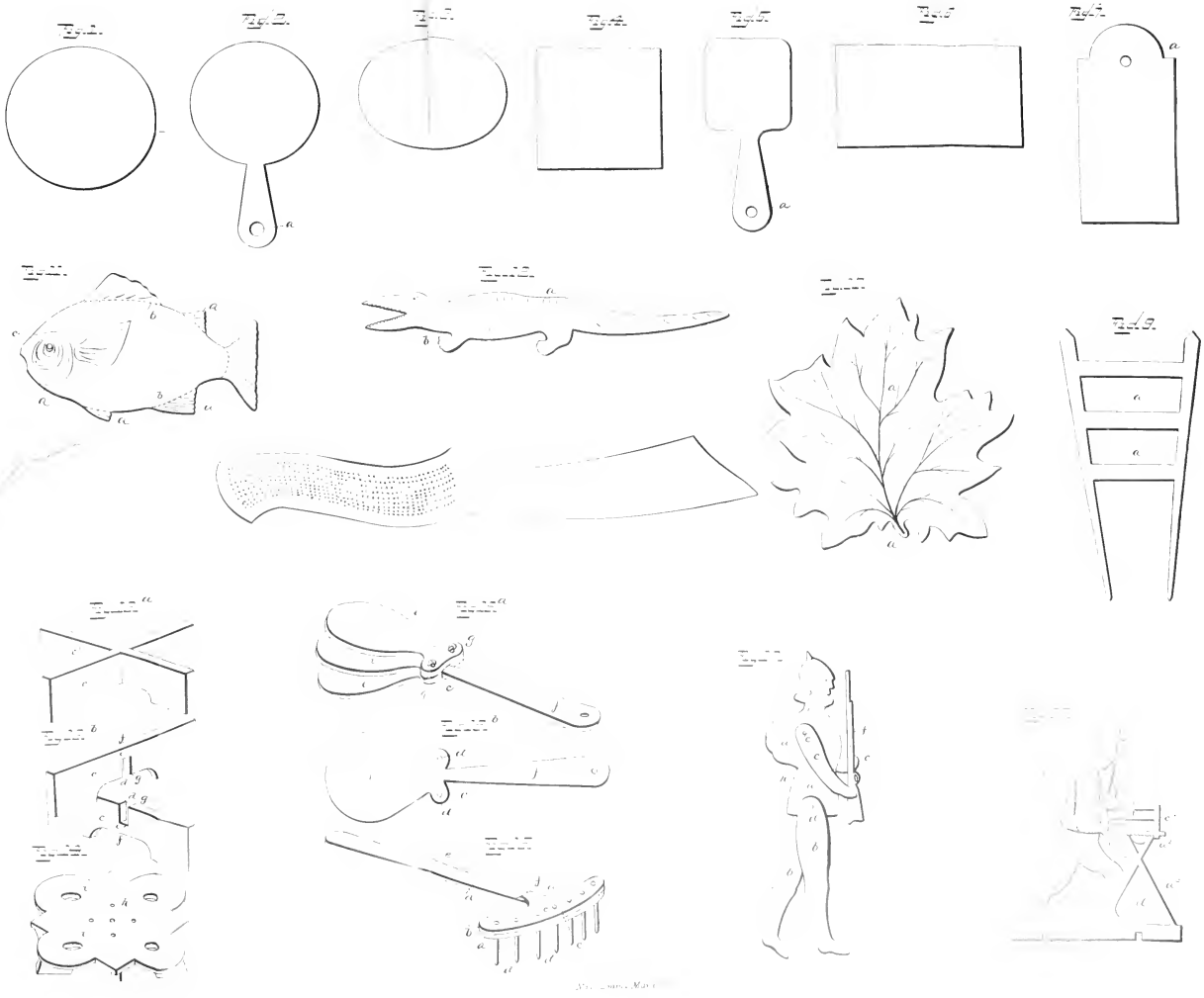

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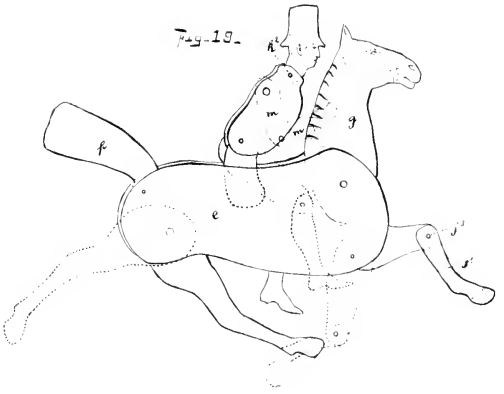

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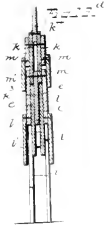
Fig. 19.b



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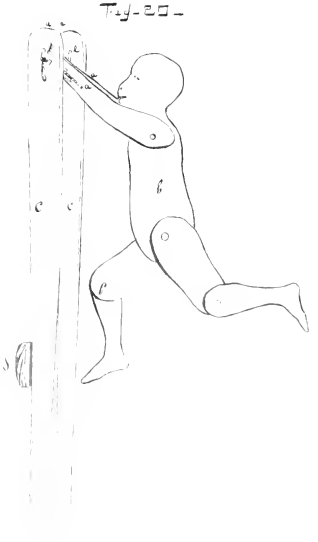

Fig. 20.

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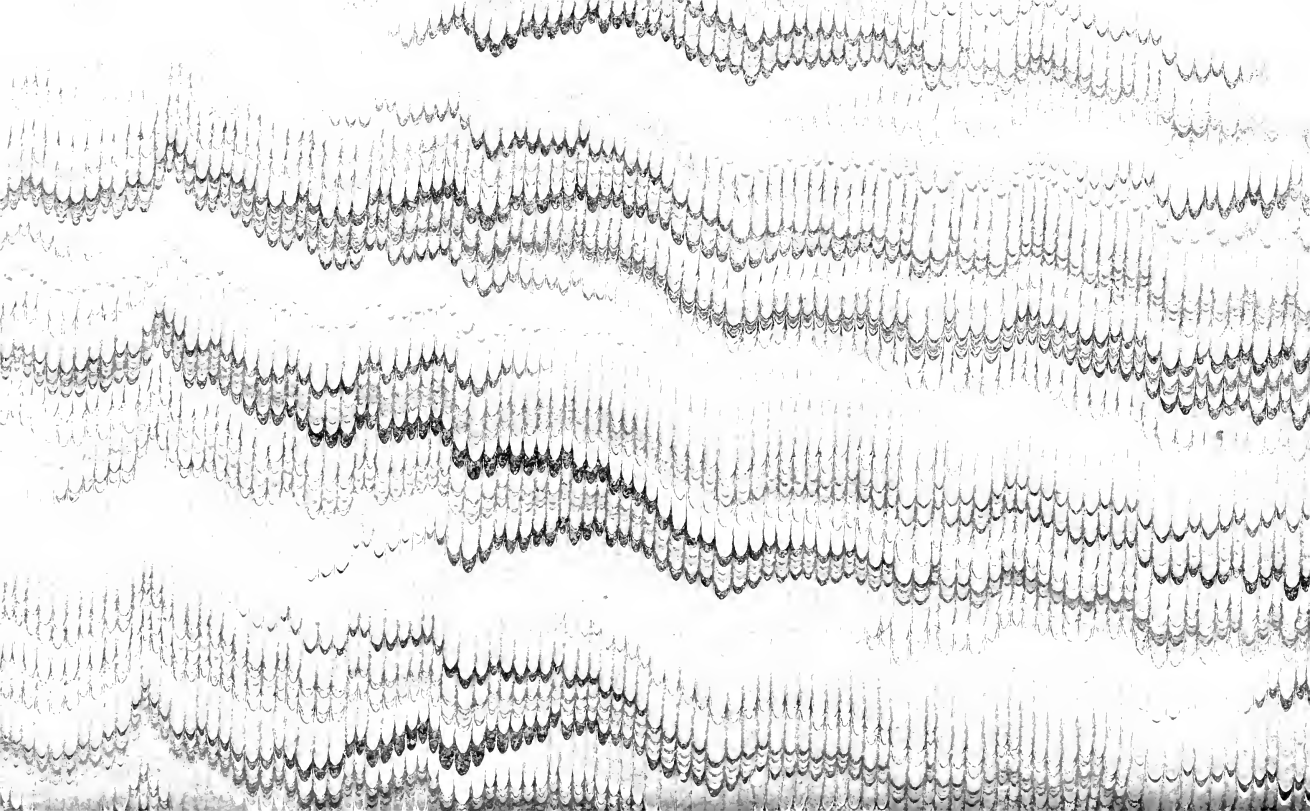

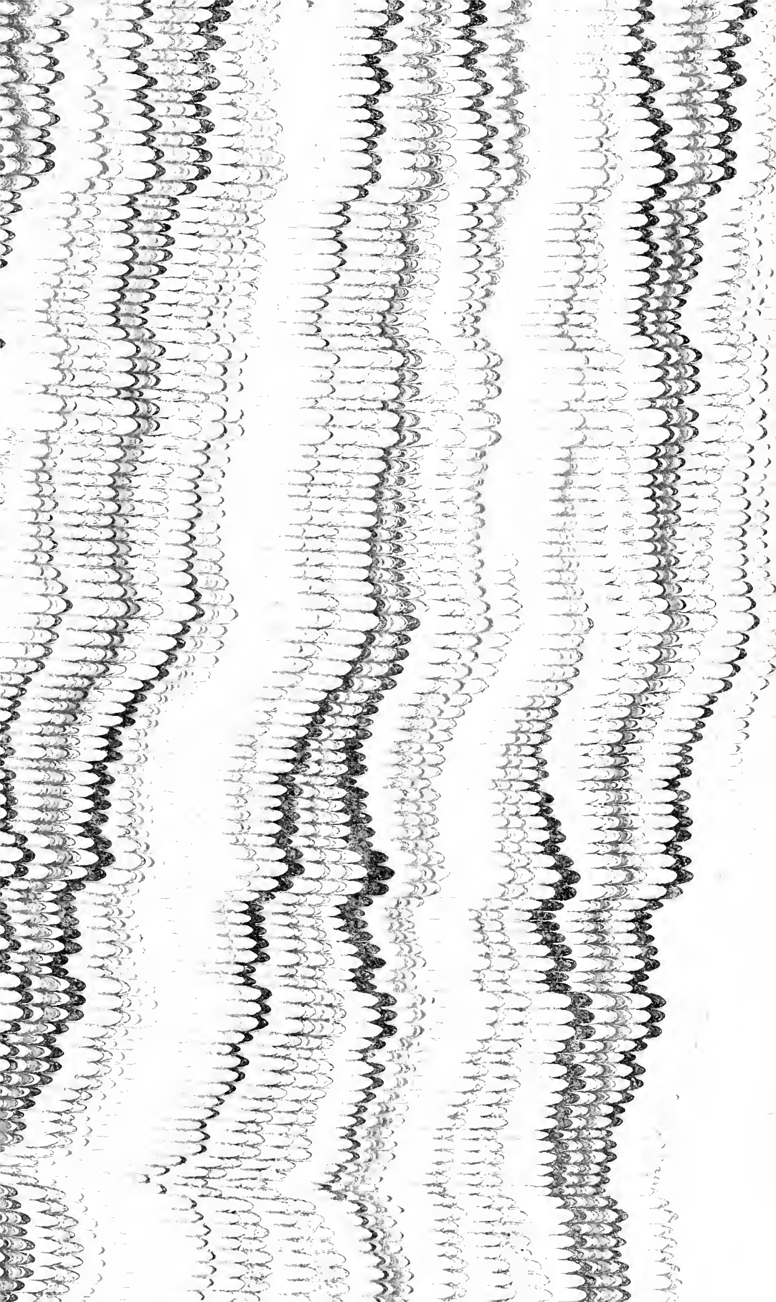

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